Digitized by the Internet Archive
in 2015

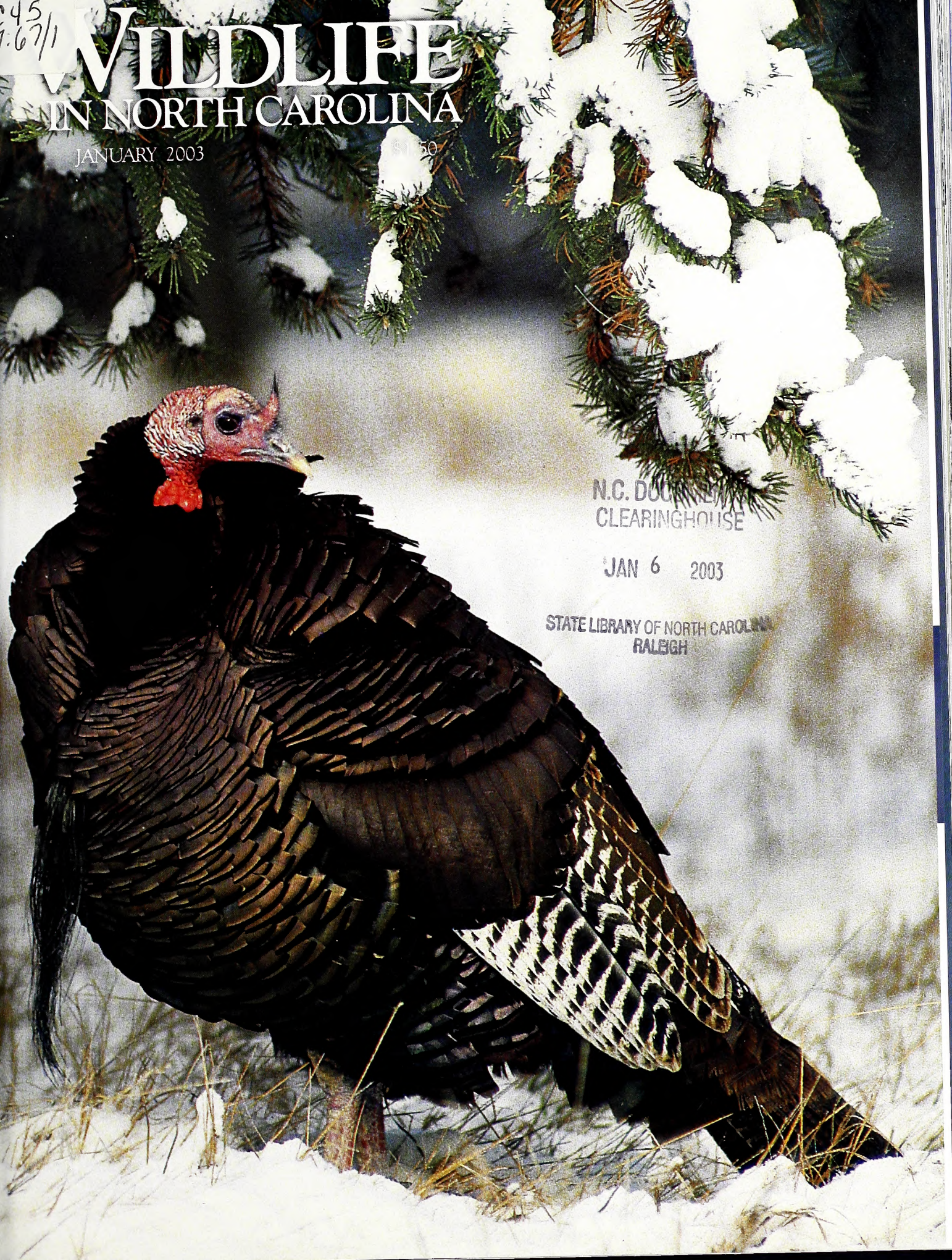
https://archive.org/details/wildlifeinnorthc67unse

c45
1.67/1

WILDLIFE IN NORTH CAROLINA

JANUARY 2003

$1.50



N.C. DOCUMENTS
CLEARINGHOUSE

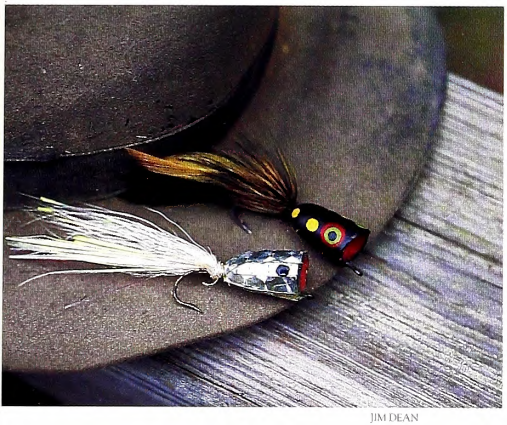
JAN 6 2003

STATE LIBRARY OF NORTH CAROLINA
RALEIGH

Carl's Black Beauty

by Jim Dean

To be honest, I don't remember very much about Carl Churchill, except that he was a reporter for the *Daily Herald* in Roanoke Rapids when I was growing up there. He worked for Dick Kern who was managing editor and Don Hall who was editor and publisher, and he'd been around a long time. Carl was a fixture at ball games and public functions, a rather small, reserved man. I seem to recall that he usually wore a fedora. I thought he looked exactly the way a reporter ought to look—or the way Ring Lardner might have described one—but he was friendly, and there was nothing sinister about him.



JIM DEAN

I was probably in junior high when I discovered that he was also an artisan of rare and surprising skill. My grandfather Will Dean had taught me to use his fly rod, and we had been catching a few bass at Bluegill, an old millpond halfway to Littleton. One afternoon, we were hanging around the tackle shop Baldy Harris owned on 10th Street when Grandpa showed me a card of handsome, cork-bodied bass bugs.

"Do you know that Carl Churchill makes these bugs?" he asked. "They're the best I've ever used. Pretty, aren't they?"

I was amazed. I couldn't imagine Mr. Churchill hunched over a vise in the evenings turning out such wonderful things. All the bugs were glossy black with rows of yellow spots and tails of black and yellow hackle. The eyes were green with red borders and black pupils, and each cupped mouth was painted red. It was his special pattern for the bug he called "The Black Beauty." We bought only one that day, but it wouldn't be the last.

We used Carl's bugs frequently, extending our fishing trips to Jordan's Pond, Chowan River, Wiccacon Creek, Currituck Sound and the Little Alligator River, where Grandpa had a fishing camp. I never learned where Carl fished, but I quickly recognized that his bugs had subtle advantages borne of obvious experience. They were so carefully tied and painted that they were nearly indestructible, and there was plenty of gap between the hook point and the body of the bug so that you seldom missed a strike. When necessary—in choppy water, for example—Carl's bugs "popped" with explosive authority. Though the original Black Beauty was his signature bug, I seem to recall that he made smaller versions, as well as some that were white with black spots.

"I thought it might be a mistake to risk Carl's 50-year-old Black Beauty (now a platinum blonde) on all those sharp teeth. But I figured I owed it to him."

After my grandfather died, my limited supply dwindled. Carl had also passed on, so there was no way to get more bugs. For many years, I kept the last battered Black Beauty stuck in the band of Grandpa's old fishing hat atop a gun cabinet in my den.

Then one day a couple years ago, I was rummaging through some old tackle and ran across a Black Beauty, virtually unused. I found three others in various stages of disrepair. Recalling their effectiveness, I decided to refurbish one of the damaged bugs and see if it would catch a rockfish (striped bass) in the Roanoke River at Weldon. It seemed a fitting quest, especially considering that the river, in Carl's day, had been so polluted that fly fishing would have been unthinkable.

I replaced the moth-eaten tail with white bucktail and strands of Flashabou, glued strips of silver Mylar over the cork body and coated the bug with clear epoxy. It looked like a strumpet in Sunday clothes, but I thought it might work. That spring, Carl's reborn Black Beauty caught plenty of stripers. Indeed, it was more effective than my modern, foam poppers. I put the bug away, thinking that I needed to try to copy its dimensions and design.

This past October, that bug was still in my fly box when Harry Bailes, Dave Fussell and I spent two days chasing albacore and Spanish mackerel with our fly rods at Cape Lookout. On the second day, we found acres of popeye mullet and menhaden at the point. Schools of Spanish up to 4 pounds were tearing through them. We caught so many Spanish on Clousers that we decided to see if they would hit poppers.

Even with a wire leader, I thought it might be a mistake to risk Carl's 50-year-old Black Beauty (now a platinum blonde) on all those sharp teeth. But I figured I owed it to him.

The first Spanish that jumped on the popper was as long as my arm. So, Carl, wherever you are, I thought you'd like to know that one of your ageless Black Beauties has undergone Botox and a dye-job and caught fish neither of us would have dreamed possible when you tied it. I stuck it in Grandpa's hat alongside the other one. They make a pretty handsome couple.

Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

January 2003

Volume 67, Number 1

Features

2 **Tundra Bombers** *written by David Hart*
Large and abundant, tundra swans provide an excellent game species for North Carolina hunters.

8 **Winter Wonderland** *photographed by Bill Dueyck*
Snow and ice transform the North Carolina mountains in winter.

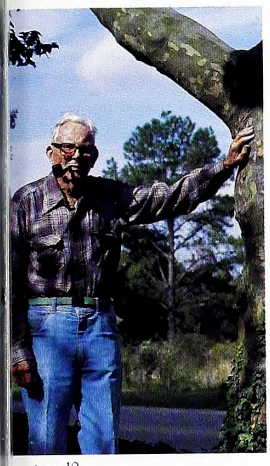
10 **The Wildlife Sower** *written by T. Edward Nickens*
Charlie Woodhouse, one of North Carolina's first wildlife biologists, logged a million miles distributing food-plot seed to farmers—and changing attitudes toward wildlife.

16 **A Second Turkey Season?** *written by Chris Powell*
The incredible success of the wild turkey restoration program has come home to roost. Is it time to create a second hunting season for a species that has taken three decades to rebuild?

20 **Alien Claws** *written by Clyde E. Sorenson*
illustrated by Jim Brown
Non-native scorpions are making a move into North Carolina.

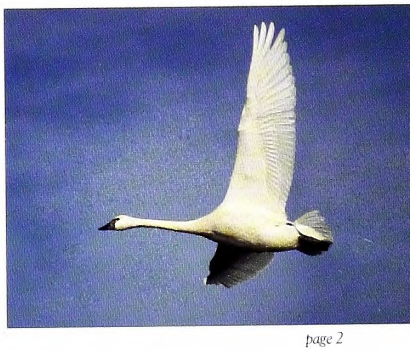
24 **Normal for Norman** *written by Scott Van Horn*
Lake Norman can't support trophy striped bass, but recreational anglers should be pleased by 5-pounders.

37 **N.C Wildlife Resources Commission, 2000-2002**
Our biennial overview of Wildlife Commission accomplishments and programs.



page 10

page 20



page 2

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Consie Powell* 28
Back Porch *by Brad Deen* 32
N.C. WILD Store 61

Cover *A gobbler takes refuge under a snow-covered branch. Photograph by Bill Lea.*

page 28

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C. and additional mailing offices. Subscription rates: one year $7.50, three years $20, lifetime $100. All foreign subscriptions are $23.50 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.

Tundra Bombers

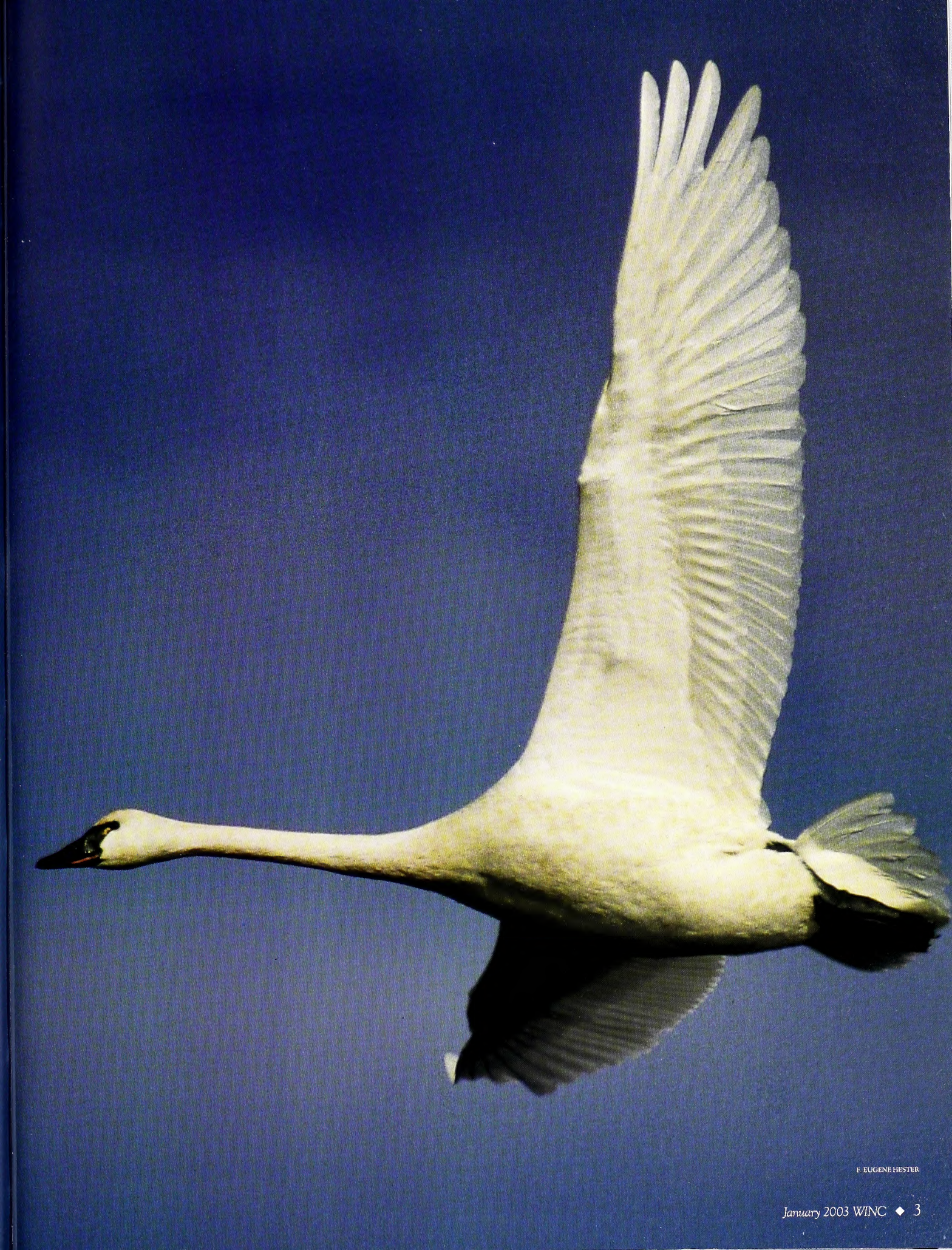
written by DAVID HART

Large and abundant, tundra swans provide an excellent game species for North Carolina hunters.

Two hundred, maybe 300 tundra swans rested on the calm waters of Currituck Sound a half-mile away. Jim Clark, his friend Alton Whitehurst and I leaned hard on the railing of Clark's pine-tree-covered stake blind 2 miles away from the boat dock, wondering if the big white birds would get up today. It was already 11 a.m., and Clark, a waterfowl guide from Knott's Island, expected the morning flight to be well under way. But things don't always go the way a hunter wants.

The raft of birds had risen in unison three times already. The rush of wings and the cacophony of swan talk offered a glimmer of hope that the morning would turn from a bird-watching event into an actual hunt. But each time, the birds swirled back down onto the water in a single strand of white, as if they were taunting the three men perched in the blind off in the distance.

Swans aren't particularly difficult birds to hunt. Find a place they've been using regularly, set out a dozen or so decoys and wait. Thanks to a limited number of permits and a one-bird-per-season bag limit, tundras don't spend the winter dodging steel shot like geese might. They can be decoy-shy toward the end of the season, particularly around public hunting areas and other places that get a fair amount of pressure from duck and goose hunters, but Clark says that sooner or later, some birds that haven't seen a decoy all year will wander by. For as long as he's been taking swan hunters and targeting these big birds himself, Clark has averaged nearly 100 percent success.



F. EUGENE HESTER

A flock of tundra swans passes over a duck hunter tending to decoys in the Pamlico Sound.

F. EUGENE HESTER

"Everybody's gotten an opportunity, at least. It's hard to miss such a big bird," Clark says, "but I've seen a few people do it."

A commercial fishing boat plowed through the water a mile away, its course dead-set on the swans. We got our break. When the small craft neared the swans, they rose like a single, screaming cloud of white, then split into smaller groups. Singles, pairs and small flocks passed within 200 yards of the blind, a few birds swung closer, but none cupped their wings to drop in among the decoys. Most never gave us so much as a passing glance. Clark and Whitehurst, both accomplished swan hunters, cupped their hands over their mouths and cried out with a series of "whoo-whoo"s and "look-look-look-look"s, fine imitations of the real thing.

There are no commercially available calls for swans, but that hasn't stopped Clark from pulling in distant birds. He simply cups his hand over the side of his mouth and belts out a series of yells that sounds strikingly similar to the real thing. It's hard on the throat, he admits, but until somebody starts selling a hand-held call, it will have to do. Spend some time in swan country, and you can't miss the unmistakable call of these grand birds. It's not hard to imitate at all.

Finally, a lone adult tundra swan skimmed low over the water and then rose up as it approached the decoys gently bobbing in the water. With a single shot, Clark's swan season was over.

"Once they start heading toward your decoys, you really don't need to call anymore. If they want to come in, they'll come in," he says.

Dinner Guests

Although tundras feed primarily on aquatic vegetation, their feeding habits have been shifting to a more terrestrial diet. Most hunters have followed, says Dennis Luszcz, migratory bird coordinator for the North Carolina Wildlife Resources Commission. Clark, however, has a dozen pole blinds in and around Currituck Sound where he guides duck hunters, so he takes advantage of the situation and hunts swans out of those

Getting a Permit

Swan permits are available through a lottery system. The application deadline is Oct. 1, so you'll have to wait until this summer if you want to apply for this unique hunt. The application fee is $10, and your chances of getting drawn are 99 percent, according to Wildlife Commission statistics. For more information, visit the commission's Web site at www.ncwildlife.org, or call (800) 675-0263.

F. EUGENE HESTER

Though their populations are healthy today, swan numbers dove dramatically in the early 1900s—a result of unregulated hunting.

same blinds. Grain fields are excellent places to set out a decoy spread, and those wheat, corn and bean fields that were once the domain of Canada geese and snow geese are now a standard feeding spot for swans, as well. However, swans tend to do less damage to a winter wheat or barley field than a huge flock of snows or a band of Canadas. Waterfowl biologist Joe Fuller says there is a wide range of emotions when it comes to swans.

"One farmer hates them while another down the road doesn't see them as a concern. It really depends on who you talk to. In some cases, swans or geese that do some light grazing on winter wheat can actually increase the crop's productivity. The most damage is done when the soil is wet and the birds actually pull the entire plant out of the ground," he says.

Although tundra swans were an important part of North Carolina's long, rich history of waterfowl hunting, the season was put on hold in the 1930s. Like so many other types of waterfowl, swan numbers dipped precariously, due largely to unregulated hunting. Conservation measures, along with dedicated wildlife officers intent on enforcing the strict laws, helped restore tundra swan numbers to where they are now.

"North Carolina has the highest population of wintering tundra swans along the Atlantic Flyway by far, and the population has been steadily increasing for about 40 years," Fuller says. "We have 70- to 80 thousand, which is about 75 percent of the total Atlantic Flyway swan population. Virginia is the only other state in the east that has a swan season, but we have many more birds than they do, so we can offer a lot more permits."

In Season

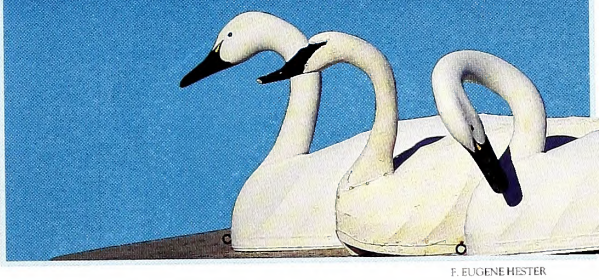
A limited season was reopened in 1984, a season that created only a slight murmur in the waterfowl hunting community. The Wildlife Commission offered 1,000 permits that season, good for one bird per person per season. But data collected by the Wildlife Commission showed a harvest of only about 200 birds. The number of permits went up dramatically after that, to 6,000, and stayed there for 11 years (with the exception of the 1989 season, which had 5,500 permits), until waterfowl biologists settled on an annual allotment of 5,000 permits. Despite the steady growth in the number of wintering swans in North Carolina, the total harvest has averaged less than half the number of permits available. That's not because these birds are so difficult to hunt, says Clark. Likely, it has more to do with being in the right place at the right time, or simply finding a good place to hunt tundras.

Food for Thought

Tundra swans are the largest native North American waterfowl in the Atlantic Flyway, with a wingspan of nearly 7 feet and a body that can weigh as much as 17 pounds. The first question a hunter might ask is this: What do I do with a bird that big? Forget the Christmas goose, and leave the turkey for those who prefer to gather their holiday feast at the grocery store. How about the Christmas or Thanksgiving swan? Or do as Jim Clark often does: He cooks his swan for large gatherings of friends or family.

Swans are similar to other waterfowl in both the appearance of the meat and the flavor, although Clark says they are a bit stronger than a Canada goose. That may not sound appealing to hunters with a taste for quail and other upland birds, but he and many other waterfowlers prefer the darker, richer meat of swans, ducks and geese.

"I'll cook swans just like I cook a duck or a goose," he says. "I normally skin them, and I'll either grill them or bake them in the oven. I also marinate them with a teriyaki sauce."



F. EUGENE HESTER

"You can take any goose decoy and paint it white, and it will work for swans. But because swans are quite a bit larger than geese, it's a good idea to use magnum decoys, which are bigger than a standard, life-size goose decoy," Clark says. "Really, even that doesn't seem to matter. If I'm hunting ducks and swans, I'll mix a half-dozen swan decoys in with the duck decoys. That's all you really need. If I'm going after only swans, I might use as many as two dozen, but it really doesn't take that many."

The hard part, as with so many other types of hunting, is simply finding a place to go. Farmers are learning that swans—like geese, ducks, deer and turkeys—are a cash crop, and hunters are often willing to pay a modest fee to hunt on private property. Knock on enough doors, and you'll eventually find a farmer fed up with these big, white birds. You might even get a chance to set out a few decoys without paying a fee.

"It's getting harder to find a place to hunt swans without paying anymore, but there are a few farmers out there that will let you hunt," says David Denton, a hunter safety coordinator for the Wildlife Commission and veteran swan hunter. "A lot of farms are leased, but there are some farmers who will charge you only a daily fee of $25 or so. That's not a bad deal when you think about it."

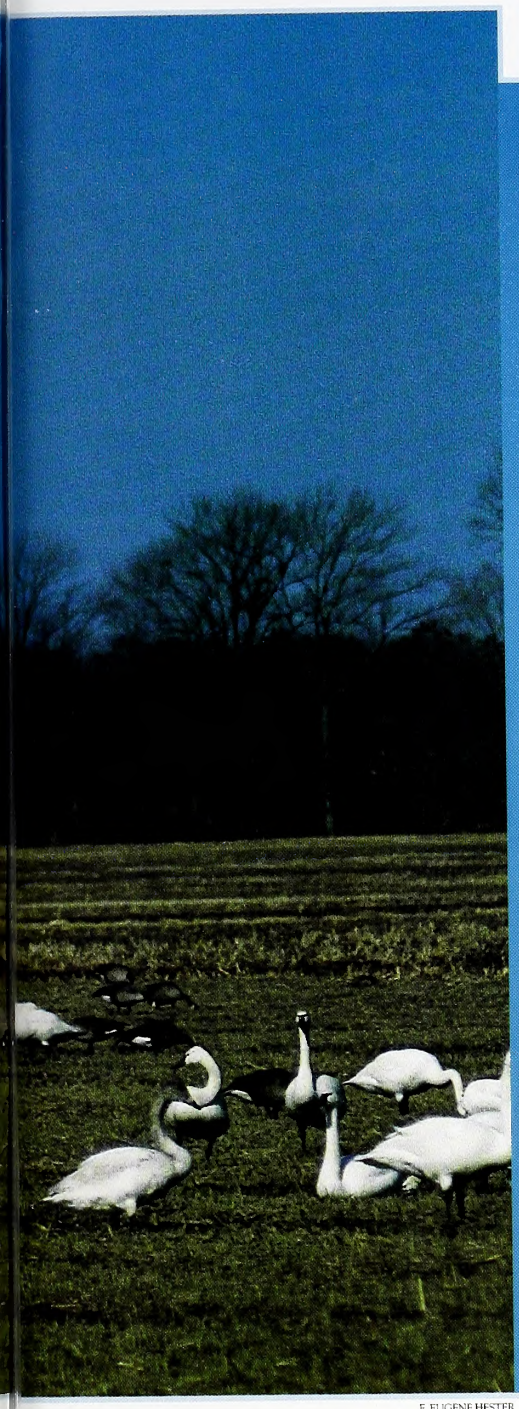
Denton hunts fields exclusively and has often volunteered to guide for friends and associates who have drawn swan permits. He and his hunting partners have had great success, and Denton has even pulled in birds close enough for hunters to get shots with archery equipment.

"I'll use as many as 200 decoys if I want to get them real close, but most of the time I'll use two or three dozen. I just use snow goose decoys, and I have some swan silhouettes that I made. I'll mix those in with the goose decoys," he says. "They decoy pretty easy, but they do seem to be getting smarter every year."

Swans in Space

In 1999, the Wildlife Commission initiated a five-year study to learn more about the life habits of these intriguing birds. Little is known about tundra swans, so biologists from North Carolina, Virginia, Maryland and Pennsylvania—along with researchers from the Cornell University Laboratory of Ornithology—are working together to determine migration routes, primary breeding areas, annual survival rates and local wintering-ground movements. A variety of methods are being used to learn more about swans, but the most valuable tools are transmitters that send signals to a satellite orbiting the earth.

Other research tools include radio transmitters, which have a range of about 2 miles,



F. EUGENE HESTER

N.C. WILDLIFE RESOURCES COMMISSION

The transmitter attached around the swan's neck allows researchers to monitor the birds' migration routes with satellite tracking. Below, a wildlife biologist attaches a band around a swan's leg.

N.C. WILDLIFE RESOURCES COMMISSION

that allow biologists to monitor local swan movements. Also, neck collars are attached that are visible from several hundred yards away through binoculars or spotting scopes. Luszcz and his colleagues attached 400 neck collars, 80 radio transmitters and 10 satellite transmitters on swans between 2000 and 2002 as part of the five-year study. Biologists fitted an additional 10 swans with satellite transmitters last winter, as well.

"The good thing about the satellite transmitters is that we don't have to be out there actually tracking the birds with hand-held transmitters or looking for them with binoculars and spotting scopes. Both of those are very time-consuming. The satellite transmitters allow us to keep tabs on the birds while we are doing other things," Fuller says.

Although the study is still under way, biologists are already getting a better idea of tundra swan migration routes and breeding areas. Cornell University researchers have found that, so far, there is no correlation between where the birds spend their winters and where they choose to nest. In other words, swans that nest in Alaska are just as likely to end up in North Carolina as they are in Maryland or even Pennsylvania. Most of the data is incomplete, however, and Fuller and other biologists are still waiting to gather more before they reach conclusions and adjust hunting seasons and bag limits, if necessary.

One thing is certain. There will always be swans in North Carolina. And as long as biologists are learning more about these graceful birds and working hard to maintain a healthy population of them, hunters like Clark and Denton will be sitting in wind-blown pole blinds or lying on frozen mud each winter with a swan tag in their wallet, a shotgun in their hands and that eternal hope that all waterfowl hunters carry with them.

Winter Wonderland

Snow and ice transform the North Carolina mountains in winter.

photographed by Bill Duyck

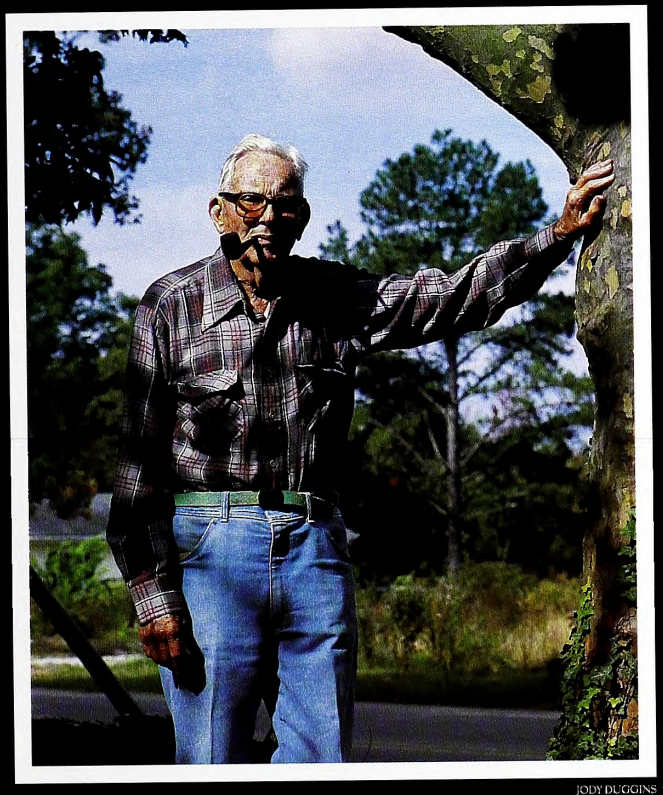
Following a snowstorm, Roan Mountain is the scene of winter in one of its purest moments. No car tracks, footsteps or even signs of wildlife have altered the image (left). And snow coats evergreens (right) like a layer of thick, sweet frosting that seemingly could be licked with delight. Even sound cannot disturb these living postcards, with the wind from the snow squall having passed, and the heartiest laugh muffled under the fluffy, white blanket. ⊠

The Wildlife SOWER

WRITTEN BY T. EDWARD NICKENS

HISTORIC PHOTOGRAPHS BY N.C. WILDLIFE RESOURCES COMMISSION

Charlie Woodhouse, one of North Carolina's first wildlife biologists, logged a million miles distributing food-plot seed to farmers—and changing attitudes toward wildlife.



JODY DUGGINS

Charlie Woodhouse started work as a district biologist with the N.C. Wildlife Resources Commission in 1947. 'In those days, there was absolutely no knowledge of wildlife,' he says. 'Wildlife was just a crop to harvest.' Times have changed, but Woodhouse believes that 'What we've seen, we'll never see again.'

Charlie Woodhouse stopped to dredge a pipe through a crackling yellow pouch filled with Carter Hall tobacco. Sweat ran down his temples; I'd found him trimming hedges around his Holly Springs home, a tidy white house overlooking N.C. 55. When Woodhouse moved to Holly Springs "in nineteen and forty-eight," he and his wife hung a swing in the front yard to keep an eye out for the few cars that lumbered down the road. Now heavy trucks groan by every few minutes, and traffic lights stall long lines of commuters. Holly Springs is but a few miles from Raleigh, and like every town within striking distance of the Research Triangle region, the community has been utterly transformed by growth in the last three decades.

But change is nothing new to Woodhouse. As one of North Carolina's first university-trained wildlife biologists, Woodhouse spent a career in the shifting traffic of great change—change in North Carolina's political systems, in the landscape and in the understanding of how land use affects the communities of woods and waters. Born in 1917 on a 125-acre farm on the Cape Fear River near Elizabethtown, Woodhouse grew up hunting and fishing and plowing floodplain fields with horse and mule. The family land was a patchwork of dark woods and sunny fields, down on the river's "low grounds."

After the boll weevil decimated North Carolina's cotton crop in the mid-1920s, Woodhouse's father found town work as superintendent of Bladen County schools, but he lost that job in the Great Depression. The Cape Fear farm kept the family alive in those lean years, and in return the elder Woodhouse kept the farm intact.

Woodhouse graduated from N.C. State College in 1941; he began work with the N.C. Wildlife Resources Commission soon after it was created. As a district biologist, Woodhouse worked from Wake County west to Alamance and Guilford counties. Those were heady days in the young science of wildlife management. Much of the Wildlife Commission's early work was directed toward quail, but by the mid- to late-1950s, scientists developed new methods to trap and stock big game that had been wiped out of their native ranges. Management for deer and wild turkey became increasingly important.

The Wildlife Commission stood poised to alter the wildlife communities of the state in dramatic ways, with the successful reintroductions of deer, wild turkey, river otter and other species. But the first seeds of the Wildlife Commission were sown on North Carolina's small farms, many by the hand of Charlie Woodhouse. . . .

The Wildlife Sower

'There were just birds everywhere'

"I've been around a long time. Long enough to know how to use a two-horse plow to break the land. On our farm, the fields were small. We had, say, five acres of tobacco, and that was probably the largest field. We grew corn to feed the livestock, but no cotton at all. We raised peanuts; back then that was a big thing, a big money crop. I remember the huge swarms of blackbirds that would come in after the harvest. We'd shoot those blackbirds and make a pie. And cowpeas—that's black-eyed peas. Meanest damn job in the world, getting up that pea-vine hay, with trailing vines 100 feet long.

"Growing up in Bladen County in the '20s and '30s, hunting and fishing was a way of life. Just about everybody hunted, and people just hunted everywhere. It was almost like the colonial days. You'd see a fellow hunting on your land, and you wouldn't think much about it.

"In the '20s, though, there was what you might call a complete changeover in the land. Hundreds of farmers went bankrupt, and the land began to grow up in natural vegetation—broomstraw, ragweed, native lespedeza, grasses. It created the most wonderful quail habitat in the world. Our land was a mixture of hardwoods and loblollies, but across the river, towards White Lake, [were] the longleaf pine and scrub oak and turkey oak. They produced a small acorn that quail used extensively. That longleaf pine was just as good to quail as grown-up fields. You'd get out there where you had weedy, wet draws with honeysuckle and briers and baybushes for escape cover, and get up a covey of quail, and you could watch the singles go down. These days, they might fly half-a-mile. We rarely hunted singles—just go on and find another covey.

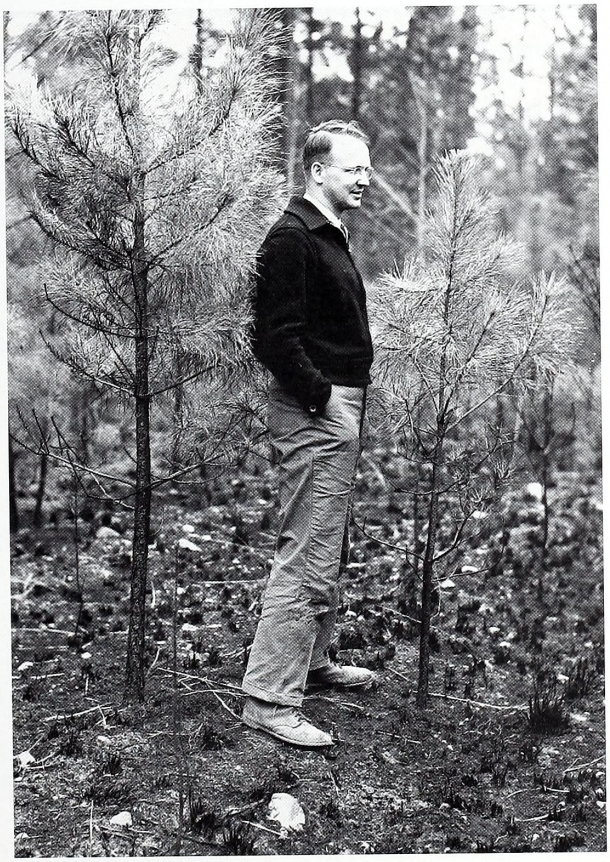
"People today love to hunt over soybean fields, but we didn't start growing soybeans, I'd say, till the early '30s. It was one of the worst things to ever happen to quail, those soybeans. That sounds strange; but before, farmers would let fields lay out, especially little, out-of-the-way fields. There'd be weedy fields in the woods, with natural food and cover. When people started planting soybeans so much, they'd harvest the beans and leave a bare field. The birds would have to take to the woods to find something to eat.

"But when conditions were right, there were just birds everywhere. It was a paradise. There's just no way people these days can understand how many quail there were. Oh, Lord, you could just find all the birds you wanted. During that time I came down with malaria, so I stayed out of school the year. I went home, and bird season opened up. It was the most fun I've had in my life."

The conservation field

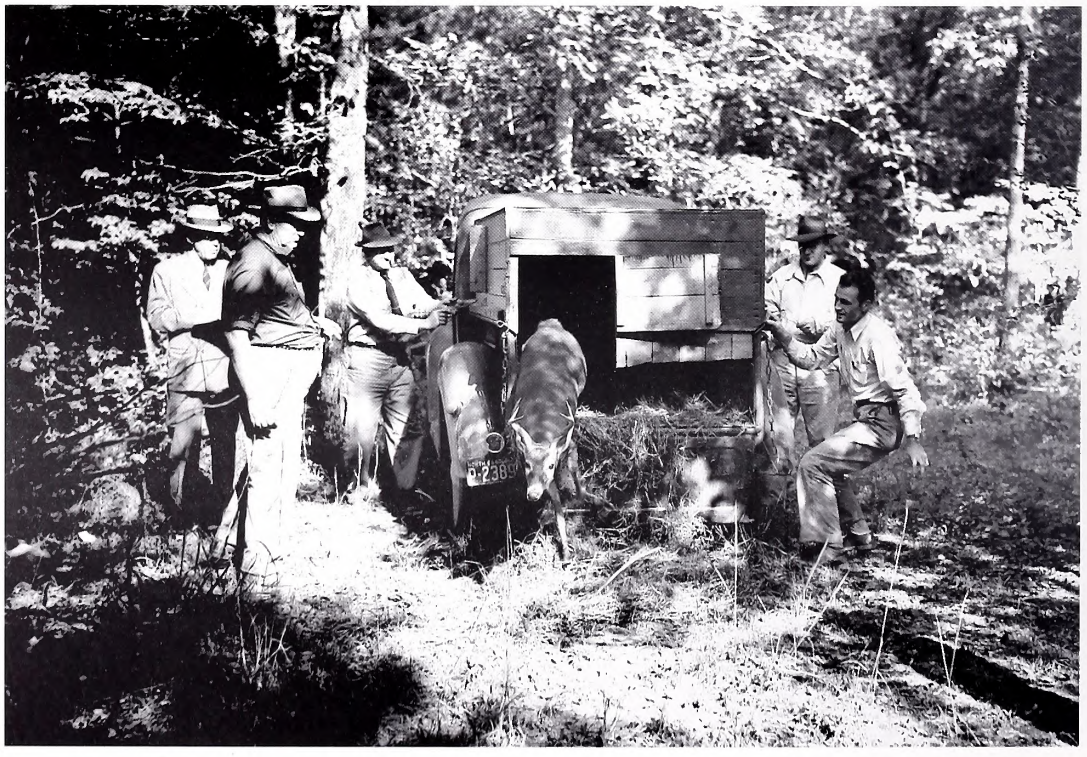
"I was in the second graduating class in wildlife at N.C. State College. I would have been in the first, but I started out in the engineering field, until I saw how much math I'd have to take. My professor, Ross Stevens, was a hard man, hard on us. There were 25 of us that started in that second class, but he weeded them out pretty fast. Only three of us graduated.

"Stevens was a bulldog type of man. He just took ahold of that idea that the state needed a wildlife commission separate from the Department of Conservation and Development. He'd say that



Biologists with the Wildlife Commission load their fleet of finned station wagons with quail hatchlings that have arrived at the Raleigh Train Depot. Most of the state's early wildlife biologists trained under Ross Stevens (left), a professor at N.C. State University. Stevens was also instrumental in the creation of the Wildlife Resources Commission.

By the middle of the last century, farming had displaced much of North Carolina's wild spaces—and some wildlife species. To reverse the loss, the Wildlife Commission released bobwhite quail (above) and deer (right) that had been imported from states where they were still plentiful. Commission biologists such as Charlie Woodhouse (opposite, with pipe) also tirelessly worked with farmers to plant wildlife food plots.



wildlife was sucking the hind teat, that wildlife was just a political football; he was very brash. But he was a remarkable person. I remember one time he took us all over to the legislature to hear a committee debate about forming a separate wildlife commission.

"So I got my degree in wildlife in 1941, just in time to go to the Army. When I got out, the Division of Game offered me a job at $100 a month. I went to work for the Fish and Wildlife Service instead. Then Stevens finally got the Wildlife Resources Commission created, in nineteen and forty-seven. They hired professional people and got rid of political appointees. It was a clean sweep, and I decided to try again. I went to work for the Wildlife Commission on Aug. 1, 1947, one month after it was created. I was one of the first six district biologists hired by the state. And I was lucky; by then they'd raised the salary to $150 a month.

"In those days, there was absolutely no knowledge of wildlife. Back then, wildlife was just a crop to harvest. It was there; it was plentiful. Game laws were insignificant. We never gave a thought to sustaining it. My daddy had a copy of Pearson's *Birds of North Carolina*, but [conservation] was something far-off, somewhere else. Something maybe you read about. There were few of us getting into the conservation field, and nothing had ever been done in the way of inventorying and finding out what we had. So that was our first job. We did a county-by-county survey of wildlife, flora and fauna. One county at a time.

"But the big news was what we called the Farm Game Program. That was aimed at helping farmers manage their land for quail, mostly, with a big emphasis on raising quail and turkeys and turning them loose. That was the extent of wildlife management, and it was very popular with the hunters. Turn all those birds loose—hell, that was great stuff! Or so we thought. With turkeys, it was the worst thing in the world to do. It took the wild right out of them.

"Another big part of the Farm Game Program was planting wildlife food patches. We worked closely with the Soil Conservation Service and county agents, and when they'd find a farmer interested in wildlife, they'd call us. We would advise farmers on places to plant and tell them to leave crop residue on the land and to leave ditchbanks growing up in hedgerows. We'd draw up a plan for each individual farm. That was still largely directed towards quail, but other animals benefited, too. It was a little unfortunate that that's what I did for most of my career. The food patches have their place, but they don't do much to improve overall habitat. We'd give the farmers advice, but what they really wanted was that free seed. Once we got into it, we could hardly stop it.

"We had big ol' station wagons, Chevrolets and Plymouths. We'd load 'em down, all right. Put extra air shocks in them, and then we could haul 1,000 pounds of seed—seeds and seedlings of bicolor lespedeza. They were 8 to 10 inches long, packed in big, heavy paper bags. I'd load up the wagon and head out to individual farmers. Lord, did I do some driving! I figured it up one time, and I know I drove a station wagon over a million miles, delivering seed and seedlings, mostly, and visiting farms. And that was the Farm Game Program."

Successes and Failures

"Later on, there was a big push for deer management. Now, growing up, I never saw deer. They were just gone from the area. But I was involved in the first stocking on private land, so far as I know. It was down around the Neuse islands, in Johnston County. Wonderful territory. We started back in 1969. We'd take a bunch of hunters up to the Caledonia Prison Farm in Halifax County, on the Roanoke River. There were 7,000 acres owned by the prisons, and they were overrun with deer. The wildlife officers would put five or six boats in the river, and we'd run the deer into the river. Hollerin' through the woods, we'd just run 'em into the water. The wildlife officers would grab hold of them by the ears and haul them in the boat, hog-tie them out on the bank, put them in a trailer and haul 'em back to the Neuse. That's the way we stocked Johnston County. It was quite a job!

"I also turned loose one of the first pair of beavers [reintroduced] in North Carolina. We got some beavers from Pennsylvania and took them to the Sandhills. They reproduced so well, we spread 'em out over the state. Back then, everybody wanted beavers. *(Laughs.)* People were just fascinated with them. Now, nobody wants beavers. It's pretty hard to figure out the public.

"I guess now everybody's trying to figure out what's going on with the quail again. You know, back when I first started working, people still complained about not having enough birds. You know why? Because people are never satisfied. But I'm not sure if we'll ever figure out what's going on with the birds. The hunters are gone, and so are the quail. I don't think it's avian predators. There's plenty of research on insecticides and things like that, but I just don't know what it is.

"But unfortunately, this much I know: What I've seen, we'll never see again." ⊠

BILL LEA

A Second Turkey Season?

written by Chris Powell

The incredible success of the wild turkey restoration program has come home to roost. Is it time to create a second hunting season for a species that has taken three decades to rebuild?

For North Carolina hunters, the winter months may no longer be the time solely dedicated to the pursuit of waterfowl and small game. The N.C. Wildlife Resources Commission is considering a proposal to implement a one-week turkey season during January. But whether or not to add this extra season remains in question, and the matter will be brought to public hearings in January.

The proposal will be to allow an either-sex turkey season for six days from the Monday on or closest to January 15 to the following Saturday. Initially, the season would be open only in Alleghany, Ashe, Caswell, Granville, Person, Rockingham, Stokes, Surry and Watauga counties. These regions hold strong populations of turkeys that wildlife biologists believe can withstand the additional hunting pressure.

The proposed daily bag limit will be one bird, with an annual limit of two birds, and only one turkey will be allowed during the winter season. The proposal would also allow for using dogs to hunt turkeys during the winter season, only. Hunting turkeys during the winter on Caswell Game Land in Caswell County would be by permit only. If approved, the winter turkey season would go into effect in 2004.

To fully understand the reasoning behind the proposal, it's important to first remember where we've been. Through the early 1970s, North Carolina was saddled with a traditional fall turkey season that was politically popular but biologically devastating. A continuous loss of habitat and hunting pressure resulted in a gradual decline of the state's turkey population which, at one time, reached an alarming level.

To reverse the trend, the Wildlife Commission eliminated the fall turkey season in 1972, replacing it with a spring gobbler season. It was not a popular action. Most hunters could not fathom hunting turkeys at any time of the year other than fall. Some believed that spring turkeys weren't "fit to eat." Others thought that hunting the birds during their nesting season would further decrease populations.

Nevertheless, the elimination of the fall either-sex season and the creation of the spring gobbler-only season proved to be a significant turning point for turkey populations. Combined with an aggressive restocking program, those measures have made the wild turkey one of the greatest comeback stories in the history of North Carolina wildlife management. From about 2,000 birds in 1970, the population has doubled almost every five years. Today 130,000 wild turkeys roam the state and are now present in every county.

With a strong turkey population, talk has inevitably turned toward the possible return of a cold-weather turkey season, in addition to the existing spring season. The season could be opened within groups of counties that average a spring harvest of .75 turkey per square mile of suitable habitat.

To get an indication of how hunters feel about the possible new season, commission biologists conducted a survey this past summer. Surveys were mailed to 1,595 people randomly selected from a pool of 350,073 hunters who hold licenses with big-game privileges. Of those surveys mailed, 636 were returned—about 40 percent. Among other questions, participants were asked which of two options they would prefer: to maximize the spring gobbler season or to emphasize the spring gobbler season while allowing limited winter either-sex turkey hunting opportunities. Twenty-one percent responded in favor of spring gobbler hunting only, whereas 79 percent responded that they would like the spring gobbler as well as the winter either-sex season.

MATT LINDLER

Through the early 1970s, North Carolina was saddled with a traditional fall turkey season that was politically popular but biologically devastating.

Turkeys tend to travel in large groups during the colder months, as evidenced by the tracks in the snow.

SCOTTY LOVETT

MATT LINDLER

In addition, the hunters were asked to rank a list of options. The option most favored by participants was leaving the spring season unchanged and adding a winter either-sex season, with a one-bird increase in the annual bag limit (from two birds to three), which could be used during either season. A close second was the option of keeping the current spring season unchanged and adding a winter either-sex season, with no increase in the two-bird annual bag limit. Trailing behind were the options of extending the spring season by one week with the current bag limit; leaving the spring season unchanged and increasing the bag limit to three birds; and, finally, retaining the current spring season with no changes.

The results of the survey will be considered by the commission when it makes its final decision in March. But it's still anybody's guess what will result from the public hearings. Hunters may strongly support the winter and spring seasons or, possibly, just the current spring season. North Carolina is uniquely situated for turkey hunting, in that the states to the north have fall seasons and some spring seasons, whereas the states to the south mostly have just spring seasons. Public sentiment from the survey and the public hearings may decide on which side of the fence we fall.

"Georgia has one of the highest turkey populations in the nation," said Mike Seamster, the Wildlife Commission's upland game bird biologist. "They don't have a fall season and don't have any intentions of a fall season. Their hunters would prefer to maximize their spring season; they have a six-week spring season and a very liberal bag limit. It depends on what hunters want."

On the other hand, Virginia—which has a fall turkey season in addition to a spring season—has been able to sustain its population at about 150,000. Reciting a popular wildlife mantra, Gary Norman, the wild turkey project leader for the Virginia Department of Game and Inland Fisheries, said, "There are two evils of turkey management: One is overharvest, and the other is underharvest. Results from our study suggest you can underharvest a population. If you completely protect your turkey populations, you can expect to find maximum growth rates among the birds, but you are going to be feeding a lot of foxes. You can put those turkeys into a fall bag and have populations identical to those with one season."

But before a second season can be implemented in certain sections of North Carolina, a number of concerns must be addressed. A fall or winter season is considered by biologists to be a population-control measure. Because jakes and hens are hard to tell apart during the cold months, a number of female turkeys will inevitably be shot. And, of course, fewer hens result in less nesting the following spring. "It's just like deer," said David Cobb, chief of the Wildlife Commission's Division of Wildlife Management. "If you want to control the population, you kill does. That is why most of the states that have a fall season have had a high turkey population. Some states that have it are states that do have turkey depredation problems, such as crop damage. Twenty years ago, I never thought I would hear somebody say, 'I am having depredation from wild turkeys.' But there are states that are having that problem."

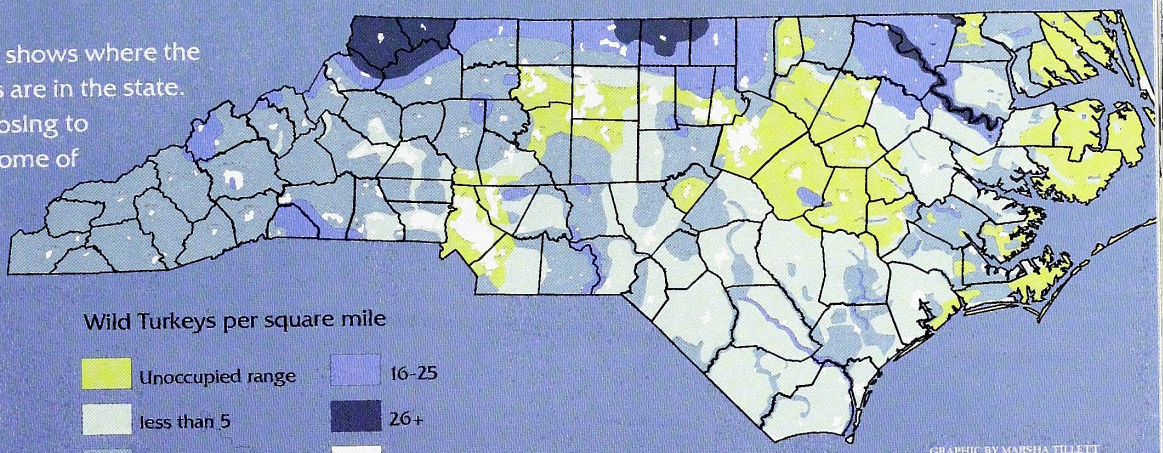
The reason the Wildlife Commission is not considering a fall turkey season is legal baiting for deer. Unlike many of the northern states, North Carolina allows hunting of deer over corn. The problem is that turkeys are extremely susceptible to corn baiting. And though most hunters are law-abiding, the ones who aren't could really do some damage.

"I would not be able to recommend a turkey season during any time period that you can put bait on the ground," Cobb said, "because the quickest way to kill off a flock of turkeys is to bait them up. They can be wiped out very quickly."

Seamster said he would also be concerned about the possibility of extremely high inci-

Where Are the Turkeys?

This wild turkey distribution map shows where the highest concentrations of turkeys are in the state. The Wildlife Commission is proposing to create winter turkey seasons in some of those areas with highest turkey densities. The proposal will be presented at public hearings in January. For a list of public hearing dates and places, see page 33.



Source: N.C. Wildlife Resources Commission

GRAPHIC BY MARSHA TILLETT

dental harvests caused by simultaneous deer and turkey seasons. This occurs when a person is deer hunting but takes a turkey that happens to walk by. "A few years ago in West Virginia, the last day of the fall two-week turkey season overlapped with the first day of muzzle-loader deer season, and 38 percent of their turkey harvest occurred on that one day," he said.

If wildlife managers seem cautious about turkey harvests, it's because they are—and for good reason. Turkey populations are driven by reproduction, which can fluctuate widely from year to year. A particularly wet spring can significantly depress nesting success, whereas a dry spring has the opposite effect. Wildlife biologists fear instituting a season that would result in a high harvest of hens in the fall or winter, followed by poor nesting conditions during the spring. If this scenario were to happen two years back to back, much of the ground that has been gained would be lost.

"In regard to turkey reproduction, we can have a total bust one year and a pretty dramatic change the next year," Seamster said. "When you shoot hens in the fall, it magnifies those peaks and valleys."

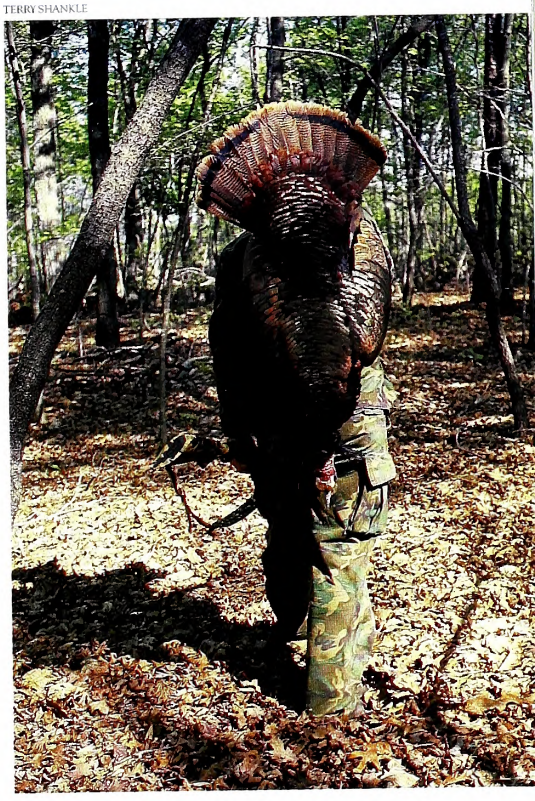
Which is why managers only can advise instituting a turkey season in January, after deer season closes. Though this scenario wouldn't allow for the traditional November or December turkey seasons, hunters could still experience a cold-weather turkey hunt, which is considerably different from the spring gobbler season. During winter, hens and broods are still together, so people hunt flocks instead of single toms. The typical way to hunt them is to comb the woods to find a flock and then attempt to scatter the birds.

"In some states, people use dogs, and they actually have 'turkey dogs' that are trained to rush in and scatter the flock," Seamster said. Hunters then set up in the place where the flock has been dispersed, give the birds 30 to 40 minutes to calm down, then start calling. "Adult hens use an assembly call, which is a long series of yelps," Seamster added. "The young birds at that time of the year use a *ke-ke-run*—a high-pitched whistle with a yelp at the end, which hunters can imitate to sound like young birds trying to get back together."

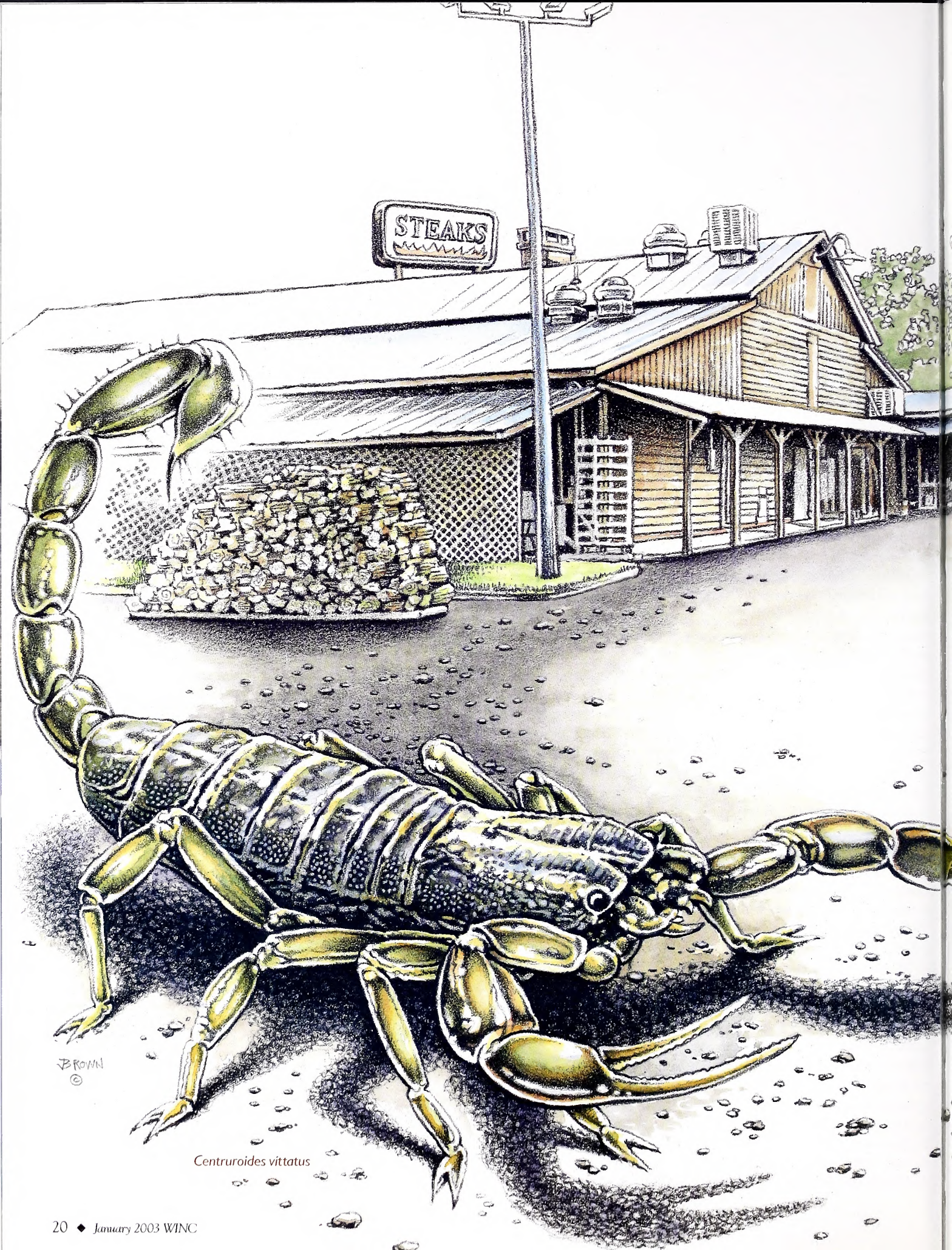
If a second turkey season is established, it will be done on a county-by-county basis in North Carolina, with new areas opening only after turkey populations reach a predetermined level. Most states that have second turkey seasons will not open a county until after it is averaging a harvest of one bird per square mile. And to avoid concentrating hunting pressure, wildlife managers would likely wait until at least three adjacent counties met the criteria, and then open them all at once.

But for now, a second turkey season exists only in the realm of possibilities for North Carolina. During the public hearing process, sportsmen will help decide how this game bird will continue to be managed. Regardless of the outcome, the fact that the Wildlife Commission is even considering another season speaks volumes about the health of North Carolina's wild turkey population. It has been three decades in the making, and is due in large part to sportsmen who agreed to replace a tradition of the past with an investment for the future. The question now is this: Where do we go from here? ⊠

TERRY SHANKLE



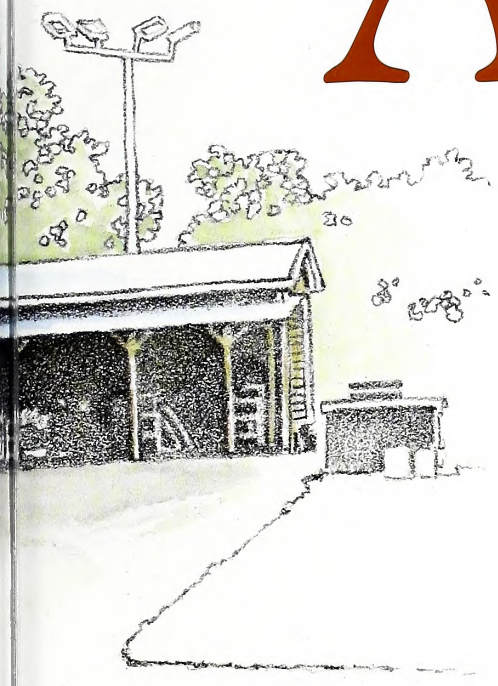
A hunter carries *away his prize after a hunt. For many sportsmen, the spring gobbler season may remain the premier time to bag their bird.*



Centruroides vittatus

Alien claws

written by Clyde E. Sorenson / illustrated by Jim Brown



Non-native scorpions are making a move into North Carolina.

The sleeping cowpoke slowly rouses to the dark sensation that he is not alone. Opening his eyes in the dim light of a nearly moonless night, he sees a pair of claws and an arched, venomous, jointed tail, silently creeping toward his jugular vein. As sweat beads on his brow, the cowboy frantically considers his options, then swiftly rolls away from the beast and crushes it with a stick.

It's a device used often in old western movies (and at least one James Bond flick): If you want to inject a bit of the sinister side of Mother Nature into the plot, drop a creeping scorpion into the scene. Scorpions serve admirably in this role; they are indeed fearsome-looking animals, armed at one end by those wicked, crablike claws and at the other by a highly mobile, venomous stinger. They also "work" in westerns because most folks associate scorpions with deserts and other arid areas. These fascinating creatures do occur in North Carolina and other southeastern states, and they may become more common here in the future—with the unwitting help of humans.

Scorpions are arachnids, related to spiders, ticks and mites, and they are among the most ancient of terrestrial animals. Like most other arachnids, scorpions have eight legs. The big, fearsome claws are actually highly modified mouthparts that they use to capture prey. Their bodies are divided into two major parts: the cephalothorax, with its mouthparts and legs, and the tail. Most scorpions have two kinds of eyes and can see reasonably well at short range, and they have extremely sophisticated systems for sensing vibrations and "tasting" the air and ground around them.

Scorpion Facts

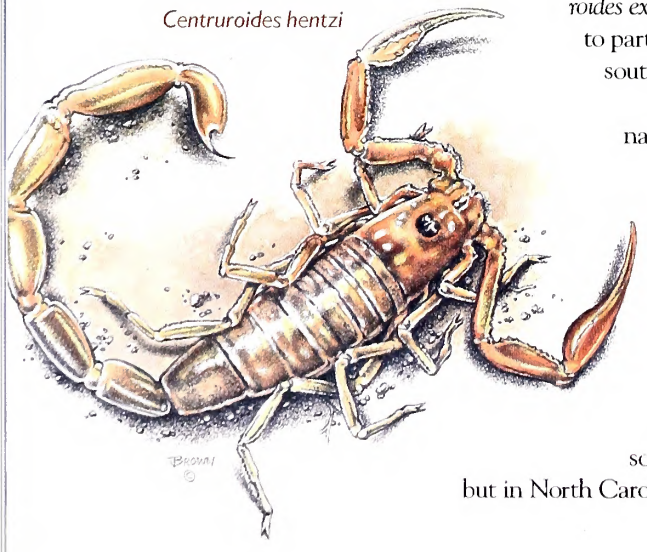
Among the most ancient of land animals, scorpions are aggressive predators of insects and other small animals.

North Carolina's only native species, *Vaejovis carolinianus*, was originally found in a few areas in the southwestern mountains.

Two exotic species, *Centruroides vittatus*, native to the Great Plains, and *Centruroides hentzi*, native to Florida, have repeatedly been accidentally introduced to North Carolina, and our native species has also been transported around the state.

Identifying individuals to species is difficult. If they become established, exotic scorpions could harm populations of small native animals.

Centruroides hentzi



Courtship and mating for scorpions is an odd and delicate process. Males have to be very careful when they select potential mates because a female who is not in the mood will probably eat him if she can. Once he does find a willing partner, he places a packet of sperm called a spermatophore on the ground and tenderly "dances" his mate over it; she then picks it up and is fertilized. Unlike the vast majority of other arthropods, female scorpions give birth to live young, often after several months of gestation. Once her young are born, she may, depending on the species, guard and care for her offspring (and sometimes feed them) from a few days to several months.

All scorpions are predators. Most focus their attention primarily on insects and other invertebrates; a few prey mainly on other scorpions. Some do occasionally eat small mammals, lizards and other vertebrates. (Almost none consider cowboys prey.) Although most species rely on their claws to capture their dinner, some species use the venomous sting at the tip of that curved tail to help subdue their prey. Scorpions are extremely efficient predators and can have major impacts on the populations of insects and other prey.

The venom socked away in that scary-looking, bulbous stinger can be an amazingly complicated soup. In those species that do use their sting on their prey, there are components of the venom that are highly toxic only to the animals they regularly hunt. Some have venom that paralyzes insects, whereas others have venom that is most effective against reptiles. These venom components are so specific that scientists have investigated some of the chemicals as potential replacements for traditional insecticides. In almost all species, the sting is also used for defense, and the venom of many species contains components with one apparent purpose: to cause as much pain as possible in mammals. A handful of the 1,400 or so species found around the world have venom lethal to humans, but the only truly dangerous species in the continental United States is the bark scorpion (*Centruroides exilicauda*) a species restricted to parts of Arizona, California and southern Nevada.

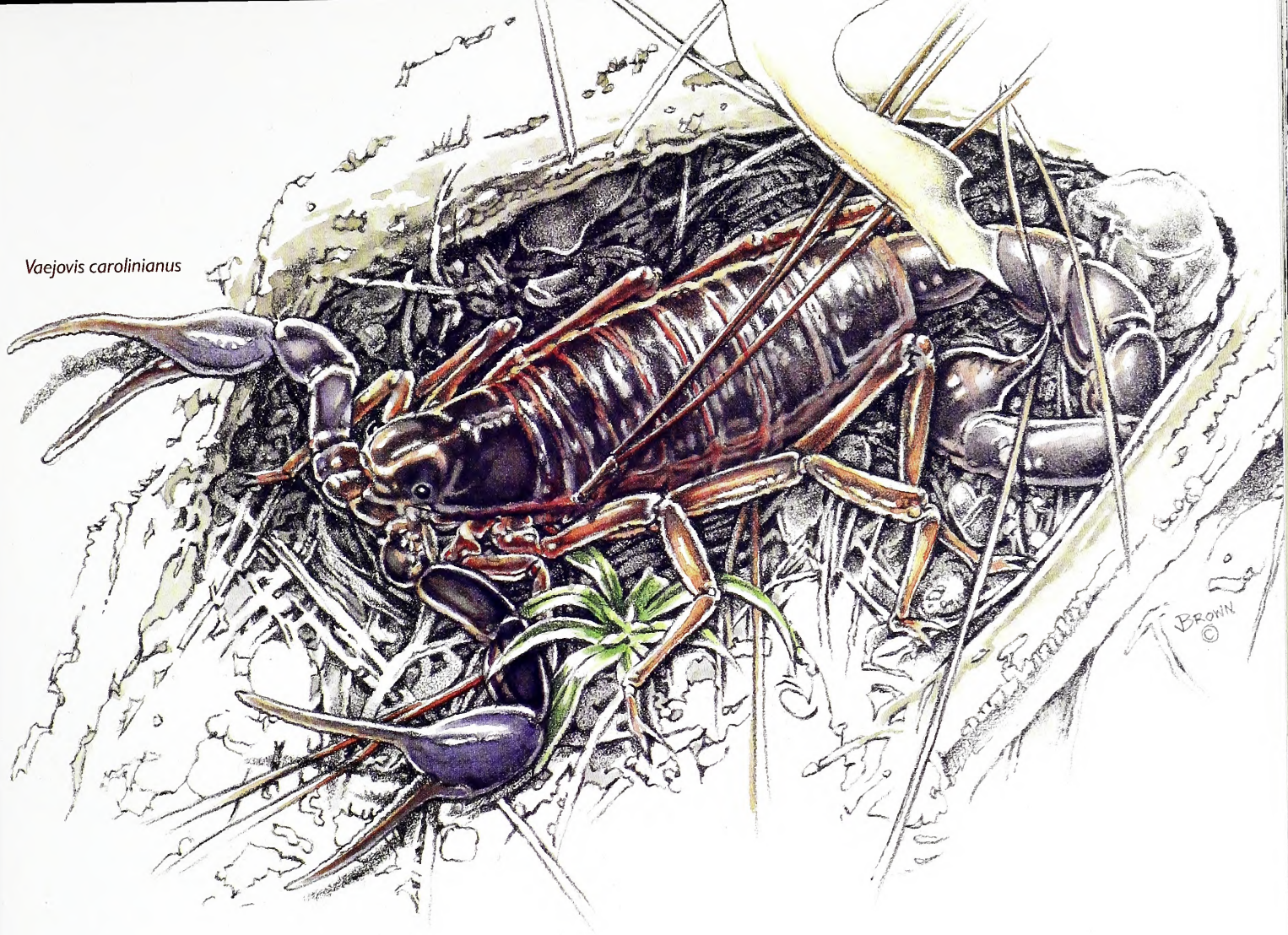
The sting of North Carolina's native scorpion poses no such threat. Our scorpion, *Vaejovis carolinianus*, is a small and rather innocuous species, and it packs no more punch than a wasp or bee sting. This species is widely distributed through much of the southeastern United States, but in North Carolina it occurs naturally in only a few river valleys high in the far western mountains. Like almost all other scorpions, it is nocturnal and spends its days hiding under loose bark or rocks. *V. carolinianus* reaches a maximum length of about 2 inches and is very difficult to distinguish from other scorpions.

Now, other scorpions may be found in our state. In 1991 a large scorpion turned up in an office in Raleigh. When Rowland Shelley, the curator of invertebrates at the North Carolina Museum of Natural Sciences, investigated, he was surprised to find that the animal was not North Carolina's native species but *Centruroides vittatus*, a species found in the Great Plains. Upon further investigation, Shelley learned that the occupants of the building had seen scorpions off and on for a year. He also learned that similar scorpions had been seen at another office building in downtown Raleigh and a site in the Research Triangle Park. All these locations had one thing in common: They were very near steakhouses. The restaurants had imported mesquite wood (sometimes in truckload lots) to flavor grilled meat, and they had inadvertently imported the Great Plains scorpions as well. Later in 1991, an additional introduction of the same species turned up at a restaurant in Rocky Mount, and one has been found in a Dare County building.

C. vittatus can get up to 3 inches or so in length and packs a fairly potent sting. It occurs as far north as Nebraska and is fully capable of surviving winters in North Carolina.

A second exotic species has turned up in the state several times during the last 15 years with, it seems, increasing frequency. This species, *Centruroides hentzi*, is native to Florida and extreme southern Georgia. It's a bit smaller than *C. vittatus* and marginally larger, on average, than our native species. The *C. hentzi* introductions have been mostly in coastal Brunswick and Carteret counties, where they seem to be associated with palm trees brought in from Florida for landscaping. Nevertheless, one turned up in a rolled towel in a dorm at Duke University several years ago, and during the summer of 2000, a man in Wilson found one crawling on Tarboro Street. He kept it as a pet for a while and then, unfortunately, apparently released it into nearby woods because he "thought it deserved a chance to live" and did not want to see it end up in a museum collection. As many as three turned up in various places around Raleigh last summer.

On top of these accidental introductions of species from other states, our own *V. carolinianus* has made appearances at several sites in the Piedmont region of North Carolina. In all of these cases, the circumstances suggest that they were transported by people moving around the Southeast.



Vaejovis carolinianus

Should we be concerned about a handful of exotic scorpions scattered around North Carolina? Can one lonely scorpion wandering around a Wilson County woodlot really cause any problems? In a word, "yes." A single scorpion, if it is a gravid (pregnant) female, can produce as many as 100 offspring of both sexes. Individual scorpions can live as long as 25 years (much longer than almost all other terrestrial arthropods) and reproduce repeatedly over that time. Scorpions are also aggressive and quite capable of defending themselves.

The sting of North Carolina's native scorpion poses no such threat. Our scorpion, Vaejovis carolinianus, *is a small and rather innocuous species, and it packs no more punch than a wasp or bee sting.*

Repeatedly over the last couple of hundred years, we have either deliberately or accidentally introduced exotic species of one sort or another to ecosystems, often with dire consequences. European starlings and house sparrows both compete very aggressively with native birds for nesting cavities and food. Flathead catfish, native to the Mississippi River basin and introduced to Carolina rivers, appear to be devouring native sunfish. Red imported fire ants, native to South America, have wreaked havoc on native insects and other wildlife, not to mention posing a significant hazard to you and me. Moreover, our local fauna have no experience dealing with scorpions, either as prey or as predators. Should exotic scorpions become established someplace in North Carolina, they could have a significant, negative effect on native insects, spiders and—perhaps—small mammals, reptiles and amphibians.

If you wish to see our native scorpion, your best chances would probably be in Polk and Transylvania counties. They can be found under rocks and logs during the day; they also occasionally show up in backyards and gardens. Like all scorpions, they fluoresce an eerie green under ultraviolet (black) light, so you might want to try looking for them at night with a portable blacklight as well. If you see a scorpion anywhere else in the state, don't emulate our cowboy hero from the top of this story; just carefully corral it in an appropriate container and call your local Cooperative Extension office. Scorpions are fascinating animals—when they are where they belong! ⊠

NORMAL FOR NORMAN

LAKE NORMAN CAN'T SUPPORT TROPHY STRIPED BASS, BUT RECREATIONAL ANGLERS SHOULD BE PLEASED BY 5-POUNDERS.

WRITTEN BY SCOTT VAN HORN

It was early. The sun was still below the tree line. He wished he'd gotten out of bed soon enough to eat another biscuit as fuel against the February cold.

He'd seen the birds sitting in the back of this cove now for several days, and he was comforted by their presence this morning. Suddenly, the surface calm was shattered. Striped bass were pushing shad up out of the deep. Some of the shad were frantically leaping clear of the water to escape the swirling bodies of feeding stripers. The gulls quickly took flight and announced the school's presence by wheeling and diving to share in the feast. He positioned his boat and hit the break line of the school with a 3/8-ounce bucktail. The fish struck the offering savagely and often.

The stripers eventually dove, only to resurface nearby. Then, two hours after the frenzy began, calm returned to the cove. The gulls remained vigilant for a while, but eventually they returned to rest on the water's surface. The sun was climbing, and he knew it was over for the morning. Time to return to warmth, a cup of hot coffee and that second biscuit. It had been a good trip. He had caught a dozen fish under exciting fishing conditions. They were a little heavier than the thin Lake Norman stripers of previous years, but none weighed more than 5 pounds. That was unfortunate in a sport where really large fish attract the most notice. But he knew he'd be back again the next morning.

KEN TAYLOR

***Striped bass such as** these juveniles in Lake Norman near Charlotte will probably never reach the 20-pound or larger size that stripers in other lakes can.*

A UNIQUE STRIPED BASS FISHERY

Lake Norman's striper fishery is something special. Seasonally, catch rates can be very good. The sheer number of striped-bass anglers on the lake argues the popularity of the fishery. Yet most of the fish are small and often thin. Not only are the trophy fish of 20 pounds or more a rarity, but also few fish are above 5 pounds. That fact is a bitter disappointment to anglers who value large fish. The two faces of this striper fishery color the debate over the success of striper management in the lake. Is the Lake Norman striped bass fishery a success story supporting hours of fishing pleasure or a disaster devoid of big fish?

Lake Norman, defying comparison with other lakes, demands to be judged on its own merits. The lake supports the fewest pounds of fish per acre in central North Carolina, including shad. Like poor soil producing few crops, Lake Norman has the lowest potential to feed and support striped bass. Adding nutrients would increase Lake Norman's production potential, but enriching 355 billion gallons of water would be cost-prohibitive. And most of our society would call it pollution!

JODY DUGGINS

JODY DUGGINS

KEN TAYLOR

Research by fishery *biologists, including the author (above), has shown that Lake Norman cannot support big fish. The water is like poor soil that can grow only scanty crops. But for the recreational angler, stripers of around 5 pounds (top and facing page) should suffice.*

In the last decade, blue- and flathead-catfish numbers have exploded at Lake Norman. White perch, recently introduced by anglers, are also rapidly increasing their presence in the lake. White-bass populations fluctuate and at times are large. All of these fish eat the same shad that the striped bass depend upon to support their numbers. Fewer shad to go around means thinner, slower-growing striped bass.

EXPECTATIONS VERSUS REALITY

Truly large striped bass—the kind making headlines in Tennessee reservoirs—require abundant food and plenty of cool, oxygenated water. Many of North Carolina's Piedmont reservoirs have plenty of shad, but none has dissolved oxygen at the cooler water temperatures preferred by large striped bass in hot, dry summers. Consequently, fish larger than 20 pounds will never be abundant in these lakes. Lake Norman has neither the optimal water conditions nor the abundant food resources necessary to support a trophy striped-bass fishery.

The environment of Lake Norman's striped bass is also influenced by electric power production. Duke Power Co. built Marshall Steam Station in the early 1970s and McGuire Nuclear Plant in the early 1980s. Striped bass congregating in warm-water discharges in winter is an obvious result of power production commonly exploited by anglers. Power production can also interact with weather to affect striper forage in the lake. Threadfin shad in Lake Norman die in cold winters. The warm-water discharges associated with power production provide thermal refugia, assuring that some threadfin will be available to repopulate the lake in spring. Fluctuating threadfin numbers may change the gizzard shad population. The size, number and types of shad present in the lake each year determine the quality of striped-bass forage.

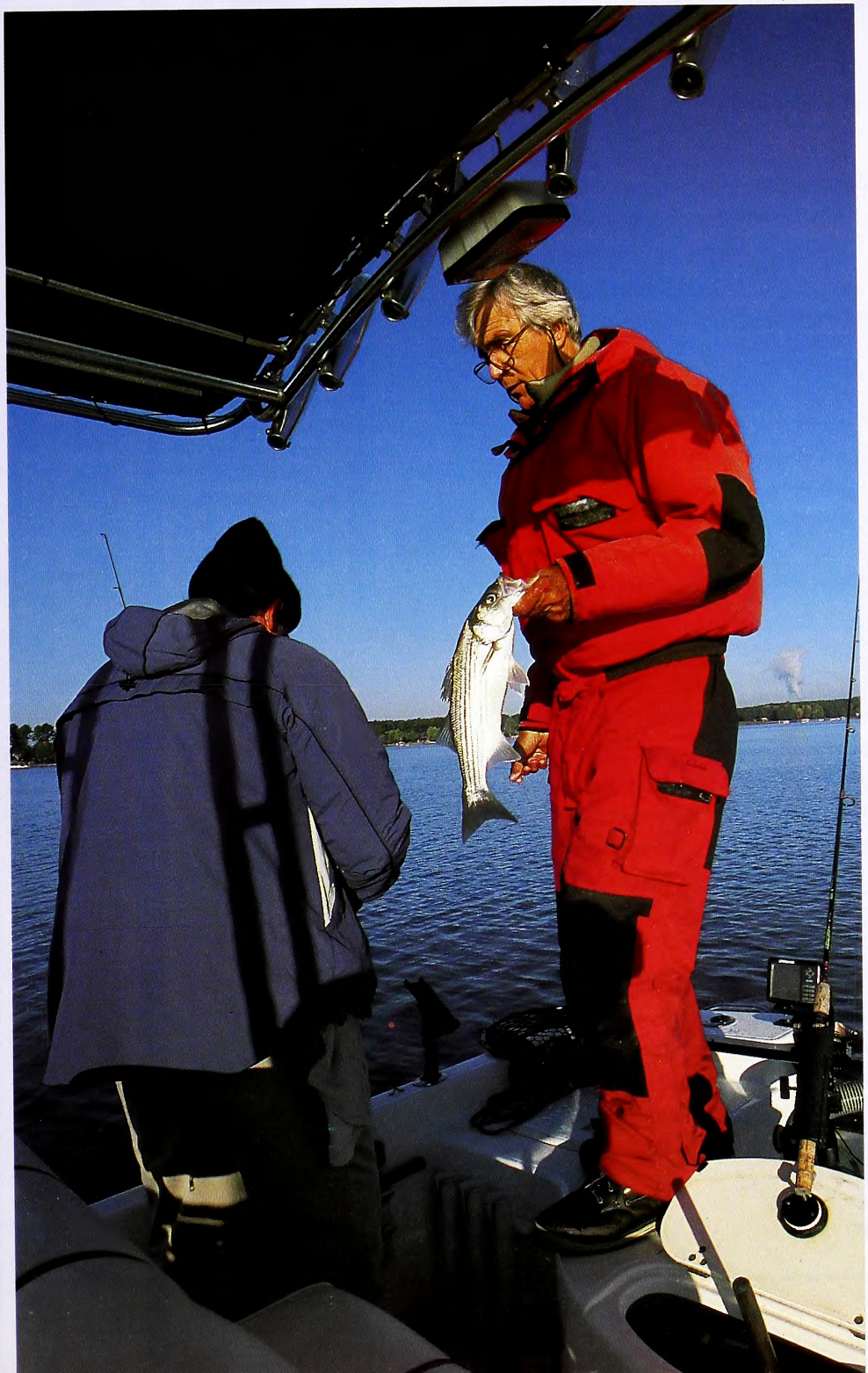
Finally, stripers are affected by fishing. It is an old axiom among fisheries managers that as fishing becomes more intense, the first fish to disappear are often the bigger, older ones. Striped bass do not reproduce naturally in Lake Norman and must be stocked by the North Carolina Wildlife Resources Commission. They were first stocked into the lake in 1969. It took anglers a decade to learn how to fish successfully for striped bass. The intervening time gave the lake's striped bass time to grow old and large. As the 1980s unfolded, anglers developed effective techniques for catching striped bass, including drifting live shad. Depth finders proved useful in locating the fish, and anglers discovered that stripers could be caught year-round, day and night. As striper angling evolved and more people joined the sport, the numbers of larger, older fish grew smaller. Catch-and-release fishing did not provide a solution, as it had for largemouth bass, because striped bass proved less hardy. The large, more desirable striped bass are least likely to survive being caught and released.

As the striped bass fishery changed, some anglers began to demand more and then larger fish. The Wildlife Commission increased the stocking rate as hatchery expansion permitted and agreed to raise the minimum size limit to 20 inches in 1992. Biologists worried that a big increase in stocking rates would tax the existing food supply for striped bass. The higher minimum size limit would keep some striped bass in the lake even longer, adding to the number of mouths feeding on a shad population that was limited by the lake's low fertility. Too many striped bass for the existing food supply could slow growth and work against the objective of greater numbers of larger fish.

THE DANGERS OF BAIT-BUCKET STOCKING

Striped bass growth did indeed slow in the years following the combined increase in stocking rates and size limits. Some anglers wanted to attack the imbalance of striped bass and shad by increasing the number of shad. Many saw the introduction of blueback herring as the solution. Biologists acknowledged that bluebacks, if successful, would benefit striped bass by replacing less desirable sizes of gizzard or threadfin shad. But bluebacks prefer to feed on large zooplankton, which are scarce in Lake Norman. In the absence of their preferred food, bluebacks can switch to eating larval fish. In fertile lakes, where fish are abundant, that hasn't been a problem. But in an infertile lake like Norman, could bluebacks reduce crappie or white-bass numbers? Biologists didn't know for sure. But they did know that blueback herring eventually would escape Lake Norman and move downstream, potentially turning a Lake Norman "solution" into a Lake Wylie problem.

JODY DUGGINS



Consequently, biologists took a conservative approach and chose not to stock herring.

In the last few years, both blueback and alewives, another herring, have become established in Lake Norman and increasingly abundant as a result of bait-bucket stocking by striped-bass anglers. Both fish historically have been used by striped bass in other waters. How will the additions affect the rest of the fish in Lake Norman and downstream? No one is certain. Biologists hope anglers don't move the fish upstream to Lake James because walleye populations in other reservoirs have collapsed following alewife introductions.

THE FUTURE OF NORMAN'S STRIPER FISHERY

The last 30 years have produced many changes at Lake Norman. It is not possible to turn the clock back on the lake's striped-bass population. What is possible in the future? Lake Norman striped bass have been thin and slow-growing because there are too many fish for the available shad. How much help the alewives provide will be revealed by time. Alewives will not double or triple the lake's shad supply because the water is too infertile. If the stripers remain thin, fatter fish can be created only by reducing the number of striped bass in the lake. Striper numbers are controlled by stocking rates and regulations. If high catch rates are important to anglers, stocking rates should be maintained. But if heftier striped bass are desired by anglers, thinning the striped bass population by imposing less-restrictive harvest limits might add a pound or so to a 25-inch fish. The future of the striped bass fishery is in the hands of anglers and the Wildlife Commission, but our choices are reduced by limitations imposed by the lake.

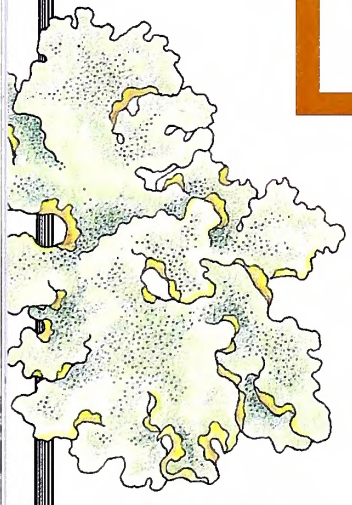
Perhaps we should build on what the lake will allow. A high catch rate of smaller striped bass is the lake's strength. Anglers crowd Lake Norman's waters in cool weather looking for a chance to catch numbers of striped bass. They know a big fish is a bonus. Others have chosen to fish different waters looking for bigger fish. It has really always been that way. Like the angler in our introductory story, we shouldn't allow Lake Norman's limitations to prevent us from experiencing the satisfaction of a good fishing trip on this very special lake. ⊠

Scott Van Horn is the N.C. Wildlife Resources Commission's fishery research coordinator for the Piedmont region.

They cover rocks, trees, roofs and gravestones all over North Carolina—and, indeed, all over the world. Take a close look at some

Lovely Lichens

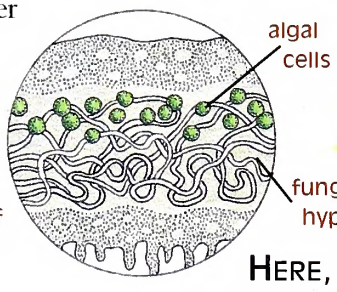
written and illustrated by Consie Powell / nature activity by Anne M. Runyon



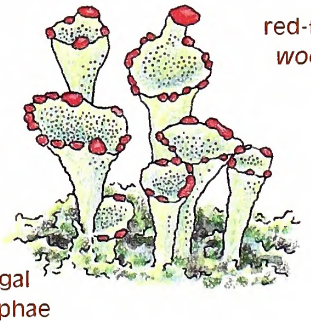
green specklebelly lichen: *trees*

PRODUCTIVE PARTNERS

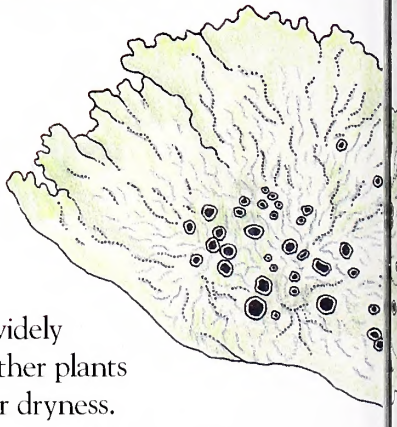
A lichen (pronounced LI-ken) may look like a plant, but it is not really a single plant. It is two simple organisms united into a single, plantlike structure that has characteristics all its own. Every lichen is made up of an **alga**, which manufactures sugar by **photosynthesis**, and a **fungus**, which provides the bulk and structure of the plantlike body, or **thallus**. The types of algae found in lichens can, and sometimes do, live separately from the lichen partnership, but the fungi found in lichens are dependent on the algae and are never found growing independently in nature.



magnified cross-section of a foliose lichen thallus



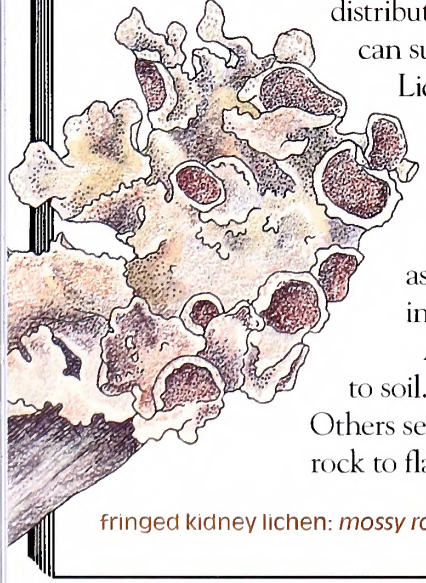
red-fruited pixie cup: *wood, bark and soil*



HERE, THERE . . . EVERYWHERE

Tiny as they are, lichens are the most widely distributed of all the world's plant life; they can be found where no other plants can survive. They can tolerate extremes of hot and cold, wetness or dryness. Lichens are found in the Arctic and in the Antarctic, in hot deserts and in humid rain forests. Their survival in a wide variety of ecosystems is possible because lichens can virtually "dry up" and become dormant. This is what happens in very cold or hot conditions. Then, when conditions become favorable, lichens absorb moisture and grow. The water content of a lichen can fluctuate from as low as 2 percent to as high as 300 percent of its dry weight. Lichens also grow very slowly, and an individual lichen can live hundreds of years.

Attached to rocks and boulders, lichens are **pioneer plants** that convert rock to soil. Some do this by producing acids that slowly etch the surface of the rocks. Others secrete **gelatinous** substances that dry on the hard surfaces and cause bits of rock to flake off.



fringed kidney lichen: *mossy rocks and bark*

bushy beard lichen: *deciduous trees and shrubs*

MAKING MORE LICHENS

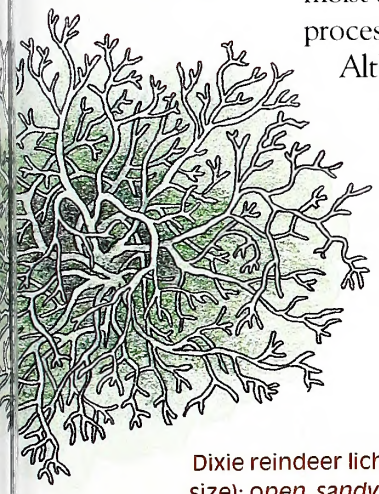
Lichens usually reproduce **vegetatively**. Tiny dustlike particles called **soredia**, which are clumps of fungal **hyphae** surrounding a few algal cells, break loose from a lichen. They are carried by wind or rain to a new location, where they grow into new lichens. Sometimes small pieces of dry, brittle lichen may break off in dry weather and blow away. If they lodge on moist surfaces, they can attach and grow by this process of **fragmentation**.

Although in theory lichens could reproduce sexually, they seldom do. Spores produced by the fungi in lichens are discharged into the air, but unless those spores germinate and then combine with the exact proper algal cells, no lichens will be produced.

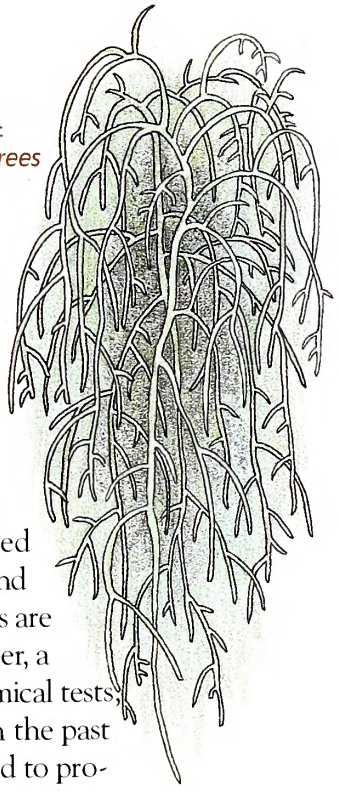
common greenshield lichen (life size): *bark*

Foliose lichens have a flattened thallus with distinct upper and lower surfaces. The edges of the thallus are often crinkled and raised.

hairy-spined shield lichen: *bark*



Dixie reindeer lichen (life size): *open, sandy ground*



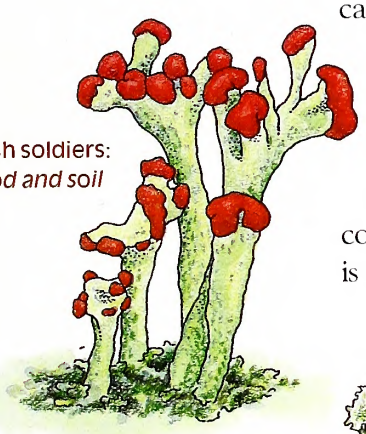
silken beard lichen: *branches of exposed trees*

USEFUL LICHENS

Numerous animals feed on lichens. Most are quite small—various insects, slugs and snails—but a few large **herbivores** also eat lichens. Because ground-living lichens grow so slowly, the nomadic herds of lichen-eating caribou in the Far North require vast stretches of space so they can always have enough to eat.

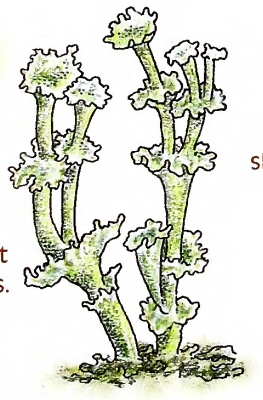
Throughout history, humans have also used lichens. Some were used in folk remedies and ancient medicines. Even now certain lichens are harvested for use as an **antibiotic**. Litmus paper, a common indicator of acidity or alkalinity in chemical tests, is obtained from several types of lichens. Both in the past and today, lichens have been used to produce dyes to color fabrics and fibers.

medallion lichen: *bark*



British soldiers: *wood and soil*

The thalli of fruticose lichens grow erect or hang and have no distinct upper and lower surfaces.



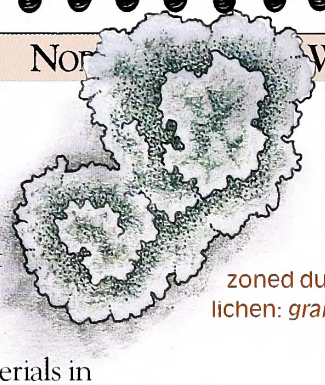
slender ladder lichen: *acidic soil*

yellow map lichen: *exposed rocks*

The lower surfaces of crustose lichens grow on and among the particles of rock or bark in hard crusts, impossible to pull off. They often look like smears of paint.

Tiny Indicators

Lichens are tiny, tough and long-lived. They have inhabited our earth for millions of years. Yet there is one thing they absolutely cannot tolerate. Lichens will not flourish if there are any toxic materials in the air. They are especially sensitive to sulfur dioxide, which is present in polluted areas and in **acid rain**. Thus, the absence of lichens is actually a significant measure of how polluted an area is.



zoned dust lichen: *granite*

What Does It Mean?

alga: (plural: algae) a primitive plant containing chlorophyll and able to manufacture its own food

photosynthesis: the process by which chlorophyll in plants uses sunlight to manufacture food that the plant can use for growth

fungus: (plural: fungi) a plantlike organsim that lacks chlorophyll and usually gains its nourishment from decaying material

thallus: (plural: thalli) the vegetative or growing body of a lichen or fungus

pioneer plants: those organisms that are first to establish themselves in an area and may sometimes prepare the area for other plant forms to follow

gelatinous: resembling gelatin or jelly

vegetative reproduction: reproduction by which one nonsexual part of a plant initiates growth of an entire new plant

soredia: vegetative reproductive particles of lichens composed of a few algal cells surrounded by a tangle of fungal hyphae

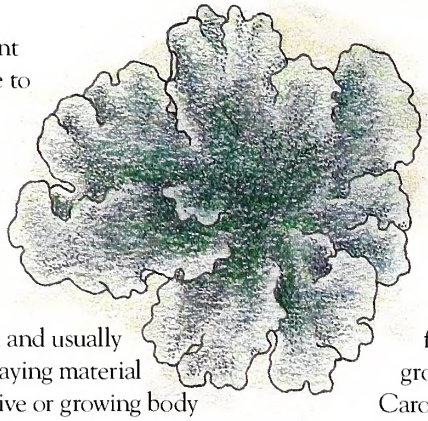
hyphae: colorless fungal threads in a lichen

fragmentation: vegetative reproduction by which bits of a plant may break off and then grow into new plants

herbivore: an animal that eats plants

antibiotic: substances produced by various fungi, bacteria and other organisms used to combat infections

acid rain: a popular name for rain that is very high in sulfuric and nitric acids often caused by industrial pollution



dog lichen: *soil*

Read and Find Out

- *Non-Flowering Plants* by Floyd S. Shuttleworth and Herbert S. Zim, Golden Press, 1967.
- *How to Know the Lichens* by Mason E. Hale, William C. Brown, 1979.
- *Lichens of North America* by Irwin M. Brodo, Sylvia Duran Sharnoff and Stephen Sharnoff, Yale University Press, 2001.

In *Wildlife in North Carolina*:

- "Life on the Rocks" by Harry Ellis, July 1987.

wrinkled loop lichen: *bark of deciduous trees*

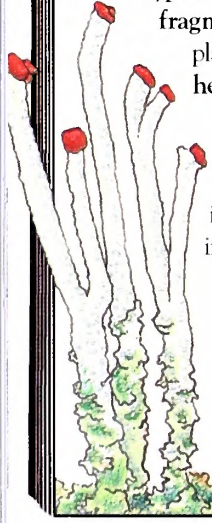
When lichens are dry, they can appear brown or dull in color. But when lichens become wet, the fungus absorbs moisture and becomes transparent, and the colorful algae show through.

Get Outside

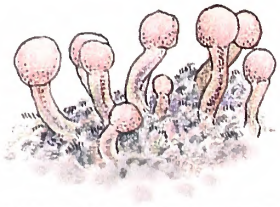
Look for lichens: You won't need to look far to find lichens. Look on rocks and trees, and on the ground too. See if you can find some of the more common North Carolina lichens illustrated on these pages. When you find some that are new to you, determine whether they are crustose, foliose or fruticose. Make sketches of your favorites. Because lichens are particularly lovely when damp, looking for them is a wonderful outside activity for a rainy day.

Collect some lichens—carefully: Lichens take a long time to grow, so don't just pry them off of any surface you find. Instead, look for lichens that are already loose for collection. Some good places to look: Cut firewood often has lichens growing on bark; peel off a patch of lichen, or of bark, if it's a crustose lichen. Twigs and small branches often fall on the ground, bringing lichens with them. Look for small rocks with lichens. Bring your lichens in where you can observe them carefully with a magnifying glass. When you are done, take them back outside and put them where you found them.

Give lichens a shower: Let one of your collected lichens dry out for several days. How does it look? Now, squirt some water on it, wait a while, then look again. How is it different now?

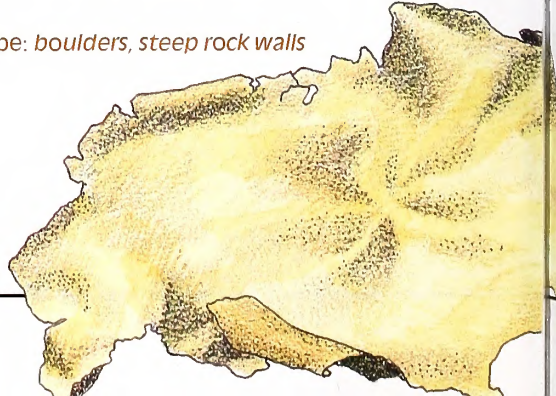


lipstick powderhorn: *old wood and soil*



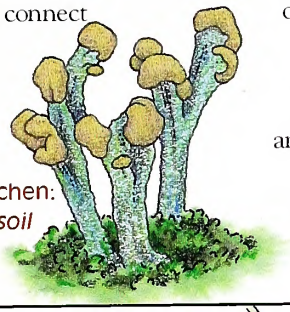
pink earth lichen: *clay or sandy soil in disturbed areas*

smooth rock tripe: *boulders, steep rock walls*



Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the Commission's Web site at **www.ncwildlife.org** and click the link for **education/ workshops.**



turban lichen: *sandy soil*

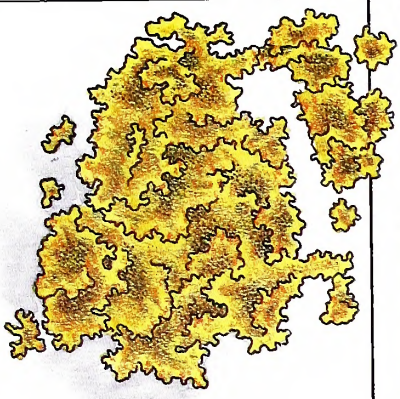
It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

Deadly Skies teaches students the effect of acid rain on various plant life.

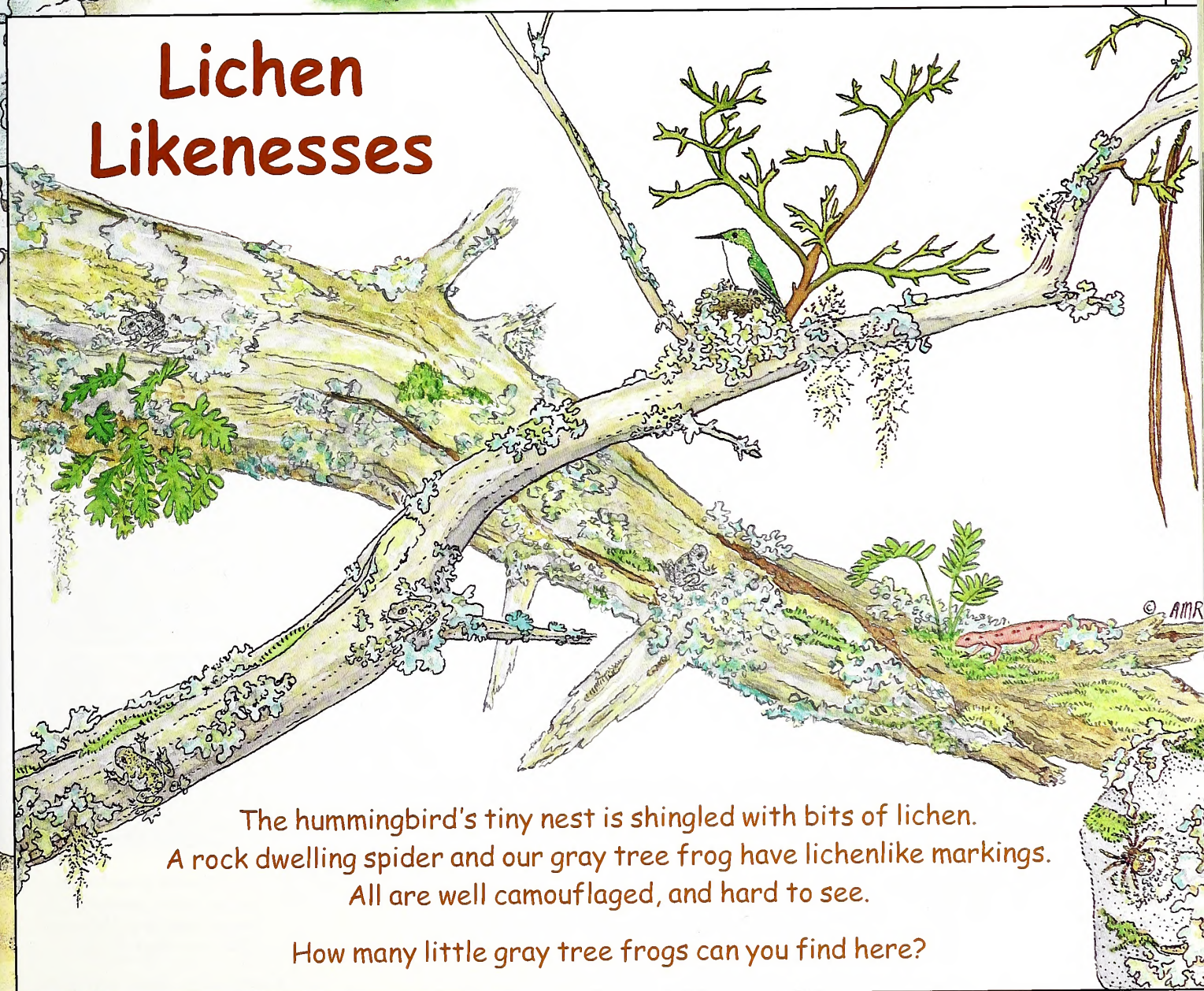
Good Buddies teaches students to identify symbiotic relations and defines symbiosis, commensalism, mutualism and parasitism.

Which Niche? teaches students to define an ecological niche.



bare-bottomed sunburst lichen: *bark, sometimes wood, rarely rock*

Lichen Likenesses

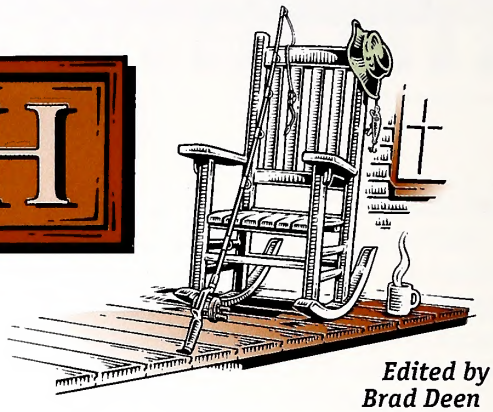


The hummingbird's tiny nest is shingled with bits of lichen.
A rock dwelling spider and our gray tree frog have lichenlike markings.
All are well camouflaged, and hard to see.

How many little gray tree frogs can you find here?

BACK PORCH

News and Wildlife Notes



Edited by Brad Deen

Poached Flytraps Replanted at Holly Shelter

The Venus's-flytrap is famously carnivorous, not migratory. But on a clear, balmy day this October, almost 200 tiny flytraps returned to Holly Shelter game land.

The rare plants—on the state's Species of Special Concern list—had been illegally dug two years earlier from the N.C Wildlife Resources Commission's game land in Pender County. "It used to be a big problem," said wildlife Officer Carl Hatcher, who caught the plant poacher and confiscated a half-filled pillowcase of flytrap bulbs. A worldwide black market in insectivorous plants made the illegal digs lucrative, Hatcher said, until federal wildlife and customs officials made several high-profile cases. Wildlife officers have also discouraged poaching on public lands by stepping up patrols, often using trained dogs.

What to do with the contraband bulbs proved to be tricky. Hatcher called around until getting in touch with the N.C. Botanical Garden at UNC-Chapel Hill, which has an extensive collection of endangered plants and seeds. "One of our focuses with the Venus's-flytrap is learning how to propagate them so people won't have to dig them from the wild," said Janie Bryan, a curator at the Botanical Garden who spent two years cultivating the finicky plants.

Venus's-flytraps grow slowly and require conditions to match their unique habitat. They occur naturally in only a handful of counties in North and South Carolina, favoring moist, acidic, nutrient-poor soils. Rapid development around Wilmington and Myrtle Beach has deprived the flytrap of much of its native habitat, said Brent Wilson, a Wildlife Commission forester. And poachers, Wilson said, "have already depleted the ones they have easy access to."

To replant the flytraps, and protect them from repoaching, Wilson and the Botanical Garden team chose an isolated spot at Holly Shelter. The site was one of several that offered suitable hydrology, forest and soil types. Using GPS coordinates, researchers will return regularly to check on the flytraps—which despite being carnivorous, can't really defend themselves from their two-legged enemies.

"Habitat destruction and poaching are the two greatest threats," said John Randall, the Botanical Garden's assistant director for conservation. "If you stem those, the plants will be protected."

—*Brad Deen*

JODY DUGGINS

BRAD DEEN

BRAD DEEN

***Misty Franklin of the** N.C. Botanicol Gorden (left, front) ond Wildlife Commission forester Brent Wilson (rear) replont stolen Venus's-flytrops.*

BOW Event Scheduled for April

The Becoming an Outdoors-Woman program, or BOW, will hold a weekend workshop this spring in the western North Carolina mountains.

The April 25-27 event will take place at YMCA Camp Cheerio in Alleghany County, overlooking Stone Mountain State Park. The cost is $185, including meals and lodging.

KEN TAYLOR

If you are a woman age 18 or older who wants to learn or improve your outdoors skills, BOW is just for you. The event includes a variety of hands-on instructional sessions in a relaxed, noncompetitive atmosphere. Activities include fishing, shooting, camping, canoeing, kayaking, map and compass, survival skills, archery and other outdoors topics.

BOW isn't limited to the N.C. Wildlife Resources Commission. It is an international program—active in 46 states and seven Canadian provinces—designed to break down the psychological and social barriers that have historically precluded women from enjoying hunting, fishing and other outdoors activities.

For registration information, call B.B. Gillen at (919) 733-7123, Ext. 260, or e-mail gillen.bernice@coned.wildlife.state.nc.us. Information is also available via the Internet, www.ncwildlife.org, or by mail: Becoming an Outdoors-Woman Program, N.C. Wildlife Resources Commission, Division of Conservation Education, 1712 Mail Service Center, Raleigh, NC 27699-1712.

Comments Sought on Proposed Hunting, Fishing Rules

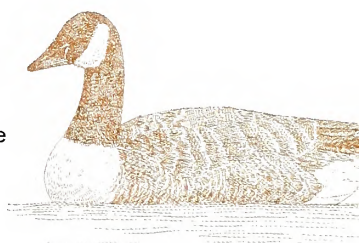
The N.C. Wildlife Resources Commission will conduct its annual public hearings this month at nine locations across the state. Wildlife Commission biologists will explain each of the 46 proposed changes to the state's hunting, fishing and trapping regulations. Members of the public will then be allowed to ask questions about the proposals or to state their opinions. Comments will be forwarded to the commission to review before it votes on the changes this spring. Any proposals that are approved would take effect during the 2003-2004 hunting, fishing and trapping seasons.

Some of the proposed new regulations are location-specific, such as re-establishing a gill net season for herring on Brunswick County's Town Creek. Others are broad, such as a proposal to establish a winter turkey season (see related story, page 16). A full list is on the commission's Web site, www.ncwildlife.org.

Comments can be submitted via an on-line form at www.ncwildlife.org or in writing to 1701 Mail Service Center, Raleigh, NC 27699-1701. All comments must be received by Feb. 17. Please include your full name and address.

Wildlife Commission Hearings **All public hearings begin at 7:00 p.m.**

- Tuesday, Jan. 14: Sylva, Southwestern Community College
- Wednesday, Jan. 15: Morganton, Municipal Auditorium
- Thursday, Jan. 16: Elkin, Elkin High School, Dixon Auditorium
- Tuesday, Jan. 21: Elizabethtown, Bladen County Courthouse
- Wednesday, Jan. 22: Graham, Alamance County Courthouse
- Thursday, Jan. 23: Carthage, Moore County Courthouse
- Tuesday, Jan. 28: Edenton, Swain Auditorium
- Wednesday, Jan. 29: New Bern, Craven County Courthouse
- Thursday, Jan. 30: Nashville, Nash County Courthouse



On Patrol

Last January, after a blanket of snow had fallen over Duplin County, wildlife Officer Chad Starbuck spotted tire tracks leading onto a pulpwood path. He found an old truck lacking both a license plate and an inspection sticker parked at the end of the path. Human and dog tracks led from the truck into the woods along the Northeast Cape Fear River.

Starbuck followed the tracks through the snow to a pair of deer stands, where another set of boot and paw

ILLUSTRATION BY JACKIE PITTMAN

tracks seemed to lead back to the old truck. Starbuck quickly backtracked the first route, arriving at the truck just two minutes ahead of a man leading a dog on a leash. He carried a shotgun, which Starbuck found to be loaded with four buckshot shells.

Dressed in camouflage with a blaze-orange cap, the man initially told the officer that he was just walking his dog. Pressed, he admitted to Starbuck that he was hunting deer in closed season. Later, in the magistrate's office, the suspected poacher asked how the officer knew he was back there. Starbuck replied: "You can't hide from the wildlife officer."

N.C. Ranks High for Sprawl

The Triangle and Triad regions have surpassed Atlanta on a national sprawl index.

Greensboro/Winston-Salem ranked second and Raleigh/Durham third in the study, which was funded partly by the U.S. Environmental Protection Agency and by Smart Growth America, a coalition of anti-sprawl groups. Riverside, Calif., just east of Los Angeles, topped the 83-city sprawl list. Atlanta placed fourth, and Greenville/Spartanburg, S.C., fifth. Charlotte was left off because the researchers who sifted the data could not obtain adequate information.

The Smart Growth rankings differ from previous studies that gauged sprawl. Instead of a single index, such as people per square mile, the study looked at factors such as low-density development with homes and businesses rigidly separated, struggling downtowns and almost total dependence on cars. The Triad and the Triangle scored poorly on many variables, such as distance lived from schools and stores, distance lived from downtown and rates of mass-transit use, combined with side effects of car-first transportation—higher fatal accident rates and more ozone, a key ingredient of smog. The Triangle had the least mixing of homes, stores and offices of the 83 metro areas in the study.

North Carolina's fairly recent economic prosperity helps explain the sprawl. Much of the state's population growth occurred in the second half of the 20th century, when development patterns favored car-dependent suburban developments.

The planning professors from Rutgers and Cornell universities who conducted the national study plan to release another one soon assessing sprawl's effects on individual health. It will compare the rates of obesity, heart disease, high blood pressure and diabetes in sprawling cities with those in more compact places.

The least-sprawling metro areas were, from the bottom: New York; Jersey City, N.J.; Providence, R.I.; San Francisco; and Honolulu. To view the complete report, log onto www.smartgrowthamerica.org/sprawlindex/sprawlindex.html.

KEN TAYLOR

EPA holds Charlotte as model

The chief of the U.S. Environmental Protection Agency called Charlotte a role model for the rest of the country in taking a regional approach to solving tough environmental problems.

"I'm here to recognize all the work you have done," EPA Administrator Christine Todd Whitman said about the purpose of her October visit. "It's unique. We've rarely seen this kind of partnership."

The EPA Regional Sustainability Demonstration Project consists of 11 counties and 15 cities within a 40-mile radius of North Carolina's largest city. The cooperation of local jurisdictions as far away as Hickory and Rock Hill, S.C., is what sets this effort apart from other environmental initiatives.

"Nature does not recognize geopolitical borders," Whitman said in a speech to representatives of the cooperating local governments. "We can't continue to think that way and approach these problems like we did in the past."

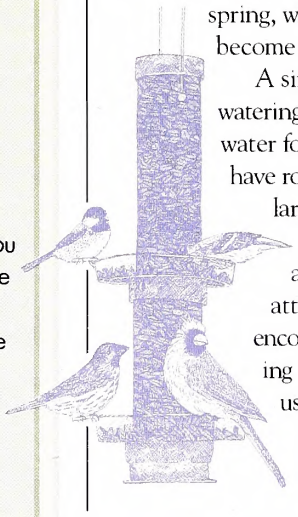
Local leaders and their staffs from across the region held meetings to come up with a specific list of actions that would enhance the region's environmental quality. Efforts ranged from encouraging carpooling to planting trees to maintaining buffers on rivers and creeks. Other suggestions focused on efforts to control urban sprawl, such as reducing cul-de-sacs in new residential developments and requiring sidewalks in all new neighborhoods.

Wildlife through the Year

Winter Wildlife Survival

Winter can be hard on wildlife—and especially so on birds trying to eke out a living in the city or suburbs. Unlike their country cousins, urban wildlife often must depend on handouts to survive the colder months.

Seedeaters such as sparrows, cardinals and grosbeaks will consume a variety of food, including sunflower seeds, cracked corn, millet and commercial seed mixes. The fruit-eating mockingbirds, catbirds and jays enjoy raisins and chopped fruit, especially apples. Woodpeckers, chickadees and nuthatches favor high-energy suet. It is important that your feeders be kept well stocked until spring, when natural sources of food become more abundant.



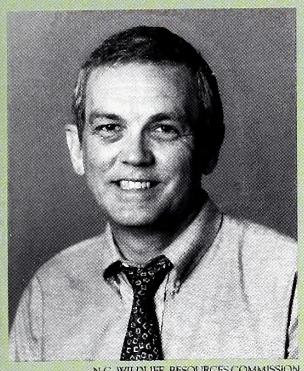
A simple birdbath or ground-watering device can supply wildlife with water for drinking and bathing. If you have room, a small pool with an area large enough to support plants that grow in water, as well as around the edge, is especially attractive to wildlife. You can encourage winter activity by keeping a section of the pool ice-free using a livestock trough warmer or small aquarium heater.

—*Chris Powell*

did YOU know?

Human activities could wipe out one-fourth to one-half of the Earth's plant species, new research suggests. Earlier studies had estimated that about 13 percent of all plant species are in danger of extinction. But a study in the journal *Science*, coauthored by Nigel C.A. Pitman of Duke University, takes better account of the tropics, where most of the world's plant species grow. In Ecuador, for example, about 83 percent of the plant species are threatened by land clearing for agriculture and climate change. Extrapolating to the entire world, suggests that from 22 percent to 47 percent of all plant species are in danger. The range of the estimate varies because botanists are uncertain how many plant species exist worldwide—from 300,000 to more than 400,000.

Fisheries Chief Assumes National Post



N.C. WILDLIFE RESOURCES COMMISSION

Fred Harris, chief of the Division of Inland Fisheries for the N.C. Wildlife Resources Commission, has been elected president of the American Fisheries Society.

AFS is the world's oldest and largest professional society representing fisheries scientists. Harris said the 9,000-member society under his one-year term will continue its mission to promote the conservation and sustainability of fisheries and aquatic ecosystems. But AFS will also work to improve communication of fisheries-related information to nontechnical audiences.

"We will increase our relevance to legislators, policy-makers and the public by expanding our capabilities to communicate science-based information coherently," Harris said. "And while I will work with the society to provide continental and global leadership in the conservation of fisheries resources, I will continue to stress the importance of the Wildlife Resources Commission maintaining its local contacts with anglers and conservationists on community and statewide levels to protect and enhance North Carolina's aquatic natural resources."

A native of Princeton, W.Va., Harris earned a bachelor's degree in biology from Concord College and a master's degree in forest resources with an emphasis in fisheries from the University of Georgia. He began working for the N.C. Wildlife Resources Commission in 1972. He became division chief in 1986.

Calendar of Events

SATURDAY, JAN. 11

The Wake Audubon Society will host a field trip to Falls Lake to search for overwintering waterfowl and other seasonal residents. For information, call (919) 571-0388, or log onto www.mybirdlist.com/wakeaudubon.html.

SATURDAY, JAN. 18

Astronomy Day at the N.C. Museum of Natural Sciences, Raleigh, will feature a universe of displays and exhibits. Call (919) 733-7450 or log onto www.naturalsciences.org.

FRIDAY, JAN. 30 – SUNDAY, FEB. 2

The East Carolina Wildlife Arts Festival will be at the Civic Center in Washington. The 2003 North Carolina Duck Stamp will be unveiled, and the winners of juried shows will be named. Other highlight events include the state Decoy Carving Championships; the Southern Classic duck-, swan- and goose-calling competitions; retriever demonstrations; and more. For information, call (252) 946-2897, e-mail gossett@coastalnet.com, or log onto the Web site, http://ecwildfowlguild.homestead.com/Index.html.

On several occasions, events in this calendar have been changed without notice. Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be sent at least four months in advance.

Loggerhead Nests Decline on N.C. Coast

This year likely will be the third in a row that the number of loggerhead turtle nests declined along North Carolina's coast.

In 1999, spotters recorded 1,140 loggerhead nests. In 2000 that figure dipped to 757, and to 659 last year. Preliminary numbers this season show about 620 nests—below but not dangerously far off the average of 764 loggerhead nests over the past decade, said Matthew Godfrey, Sea Turtle Program coordinator for the N.C. Wildlife Resources Commission.

"In my mind, there's really no indication going either way," Godfrey said. "With the data we have, I don't think we can say one way or another if the numbers are going up or down." Nesting data from the past 20 years show cyclical fluctuations for the threatened species. The downturns lasted about three years before another bumper year.

"There are all sorts of factors that could play a part," Godfrey said. They include hurricane damage to beaches, poor sand quality tied to beach renourishment projects, pollution, a general decline in the turtle population, climatic changes and development encroaching upon traditional nesting areas.

Another factor could be that female sea turtles, who mature around age 20, nest only every two or three years, suggesting that there might be more mature females that frequent North Carolina's beaches on one particular nesting cycle. Or it could mean that the turtles that did come ashore did so less frequently.

Female loggerheads can nest up to seven times, but they average three clutches per lifetime. A nest can contain more than 120 eggs, each the size of a ping-pong ball.

"I wish we could point to one thing, one factor," said David Rabon, an endangered species biologist with the U.S. Fish and Wildlife Service, "but it's not that easy. It's very difficult when you have one, two or three years of decline to say you have a legitimate decline or just a cycle of nature. But I would definitely say it's something worth watching."

KEN TAYLOR

***Researchers take** measurements of a nesting loggerhead on an Onslow County beach.*

Nature's Ways

Early Nesters

written by Clyde Sorenson
illustrated by David Williams

For most of North Carolina's resident birds, January and February are the bleakest months. Gathering enough calories to make it through another bitterly cold night is each day's biggest challenge. But for great horned owls, the cold days of winter mean romance is in the air; while most birds are struggling to survive, the big owls are nesting.

The reason for their cold-season nuptials is the greater likelihood of finding enough food to raise the next generation. Great horned owls feed mostly on small mammals such as rabbits, rats and mice. These prey are largely nocturnal, so the owls hunt almost exclusively after dark. The long nights of winter provide more hunting time, and prey are more exposed as plant cover thins.

Nesting early also allows great horned owls to commandeer an old hawk, crow, heron or, sometimes, a squirrel nest for their own. But a head start on other nesters can have disadvantages; occasionally, the untended eggs of careless owl parents freeze and die.

Finding a nest of great horned owls is unlikely (and getting near one a bit dangerous), but detecting them is easy on calm nights. Listen for the deep, five-hoot calls of the males and the seven-note calls of the females.

Commission Stocks Lumber River Redbreasts

KEN TAYLOR

Fisheries biologists with the N.C. Wildlife Resources Commission stocked 25,000 fingerling redbreast sunfish—also known as "robin"—into the Lumber River this October.

Redbreast sunfish can weigh more than a pound but typically weigh less. In North Carolina's coastal rivers, they can be caught on a variety of natural baits and small lures. Stocking of the 2-inch juveniles from Watha State Fish Hatchery in Pender County took place in October. It will take several years before the fingerlings reach harvestable size. Stocking locations included Fair Bluff at U.S. 76/N.C. 904, Princess Ann at State Road 2246 and Boardman at U.S. 74.

Lumber River anglers first reported declining catches of redbreast sunfish in the early 1990s, prompting the commission to conduct a four-year study from 1994 to 1997. Fisheries biologists electrofishing the Lumber documented declining redbreast catches: from 35 fish per hour in 1994 to 23 fish per hour in 1997. Average size of sampled redbreast sunfish did not decline, said Wildlife Commission fisheries biologist Keith Ashley.

Ashley attributed the decline in redbreast abundance to a combination of factors, including water quality changes—flooding and increased runoff—and predation by non-native flathead catfish, which have expanded their range. The Commission first collected flathead catfish in the Lumber River in 1998. Subsequently, the numbers of flathead catfish have increased in the lower Lumber River near Fair Bluff.

"Based on other rivers containing flathead catfish, such as the Cape Fear, we anticipate that flathead catfish will reduce redbreast abundance from historic levels, but not eliminate them," Ashley said. "Of interest in the Cape Fear is that while redbreast have declined since flathead catfish have appeared in the river, bluegill have become more abundant."

"The take-home message from this study was that while redbreast were somewhat less abundant in our Lumber River samples, the size structure suggests the Lumber still supports a quality redbreast fishery," Ashley said.

Catch Us at these *Numbers*

1-800-662-7137 ta repart violotions of hunting ond fishing laws

1-800-628-3773 (NC VESSEL) for boot registrotion ond titling

1-800-675-0263 far hunting dotes ond shaating hours for migratary game birds

1-888-248-6834 (2HUNTFISH) to purchose most licenses with VISA or MasterCord using a tauch-tane telephone

1-800-446-8663 (I GOT ONE) ta report big game harvests

Connect ta the Commission's anline Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $49,394,252.27

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

North Carolina Wildlife Resources Commission biennial report

7.1.00 – 6.30.02

seasons of change

MELISSA McGAW

MELISSA McGAW

John E. Pechmann, Chairman
North Carolina Wildlife Resources Commission

January 1, 2003

The Honorable Michael F. Easley
Governor of North Carolina
Members of the General Assembly
Raleigh, North Carolina

Dear Governor Easley and Members of the General Assembly:

This 26th biennial report of the North Carolina Wildlife Resources Commission summarizes our activities for the past two fiscal years, from July 1, 2000, through June 30, 2002. I am pleased to present it to you on behalf of the Wildlife Commission and its 550 employees. Our combined efforts accomplished some important goals during the biennium.

Strong cooperation with private landowners helped to increase wildlife habitat on private lands, and work with other organizations led to the acquisition of almost 25,000 acres of game lands. We likewise cooperated with other agencies—both state and local—to protect important aquatic habitats and to increase angling opportunities for our citizens. Research efforts increased our knowledge about wildlife resources, and outreach programs such as the mobile aquarium helped to communicate that knowledge to the public.

Our engineers doubled the number of projects completed within this biennium as compared to the previous one, expanding access to the state's waterways for people of all abilities. And our wildlife enforcement officers helped to ensure safe boating, hunting and fishing by enforcing regulations and providing safety education. After the Sept. 11, 2001, terrorist attacks, they assisted with additional security near the Falls Lake and Jordan Lake dams.

Planning for two new wildlife education centers continued, based on the success of the Pisgah Center for Wildlife Education. These centers will serve the state's Mountain, Coastal and Piedmont regions with on-site and outreach programs. *Wildlife in North Carolina* magazine continued to reach more than 70,000 subscribers each month with articles about sporting traditions, conservation, wildlife and natural history.

By the close of the biennium on June 30, 2002, the Wildlife Endowment Fund had a balance of more than $47 million. This important fund helps to ensure a sound future for wildlife. It accrues entirely from contributions and sales of lifetime licenses and lifetime magazine subscriptions; only the interest can be used to finance fish and wildlife programs.

These accomplishments were possible because of support from many sources: the men and women who enjoy North Carolina's hunting and fishing traditions, the citizens who care about wildlife and the organizations that cooperate with us to achieve common goals. Our work during the biennium especially relied on your support. Thank you for all your efforts on our behalf.

Respectfully yours,

John E. Pechmann, Chairman

contents

42 division of INLAND FISHERIES

46 division of CONSERVATION EDUCATION

48 division of WILDLIFE ENFORCEMENT

50 division of WILDLIFE MANAGEMENT

54 division of ENGINEERING SERVICES

56 division of ADMINISTRATIVE SERVICES

seasons of change

seasons of change

"In these higher aspirations the important thing is not to achieve, but to strive."

—Aldo Leopold (1887 – 1948)

The North Carolina Wildlife Resources Commission has been charged with managing wildlife resources since its authorization by the General Assembly in 1947. That task has always involved balancing the needs of people with those of wildlife. But changes in the last 10 years have made the balancing act a greater challenge than ever before to the commission and its employees.

According to the 2000 census, North Carolina's population increased by 21 percent during the years between 1990 and 2000. This increasing population brings a greater diversity of interests to be considered, more land development and changing economic priorities. Any of these conditions can compete with the need to conserve the state's diverse wildlife and the habitats they need to survive. Such competition can create conflict, but it can also stimulate cooperation and creativity.

This biennial report describes many efforts to develop cooperation and to implement our programs in creative ways. Some of those efforts involved new staff and organizational changes. Others involved a renewed focus on outreach to the public and on cooperating with individuals and groups that have a stake in conserving wildlife.

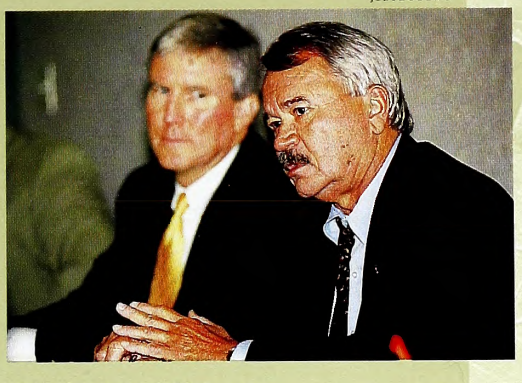
The Wildlife Resources Commission is now a 19-member commission appointed by the governor and both houses of the General Assembly. Led by Chairman John E. Pechmann of Fayetteville and Vice-Chairman Wes Seegars of Goldsboro, the commissioners meet about seven times each year to define the policies that guide the agency's work. They likewise determine the fishing and hunting regulations for the state. Part of that task involves holding public hearings and other meetings statewide to ensure that citizens can express their views on regulatory changes.

Executive Director Charles R. Fullwood Jr. serves the Wildlife Commission as chief executive officer. Chief Deputy Director Richard B. Hamilton leads the divisions that implement the commission's policies and field programs. Cecilia Edgar, Deputy Director for Administrative Services, oversees the agency's fiscal programs, including licenses and registrations, sales and grants. The agency's programs and organization are reviewed regularly to ensure that services are delivered efficiently and resources are protected.

Staff previously located in a separate Nongame and Endangered Species Section were recently reassigned to the divisions of Wildlife Management and Inland Fisheries. The Division of Wildlife Management added a human dimensions biologist and an outreach biologist. These new staff gather information from the public about game lands use and the harvesting of wildlife, and they ensure that news reaches the public about regulations, trends and events that affect wildlife.

The newly organized Surveys and Research/Technical Guidance Section in the Division of Wildlife Management worked with more than 40 private landowners to enhance 16,000 acres of private land for small game and songbirds. Moreover, almost 25,000 acres were added to public game lands during these last two years, with roughly half of that acreage on six new game lands.

JODY DUGGINS



Chairman John E. Pechmann (left) and Executive Director Charles R. Fullwood Jr.

The habitat conservation staff in the Division of Inland Fisheries reviewed plans and made recommendations on some 4,000 projects that could affect aquatic wildlife. This involved cooperation with developers and the agencies that issue development permits on projects such as interbasin water transfers, dams, water and sewer expansions, debris removal, hydroelectric facilities, beach renourishment and mining. With assistance from recreational groups statewide, the division expanded its Community Fishing and Fishing Tackle Loaner programs to new sites. The mobile aquarium traveled to 62 events across the state attended by more than 210,000 people.

The Division of Engineering Services added eight new staff to implement an improvement plan for public boating and fishing access. This expansion was funded by increased receipts in vessel registration fees. As a result, 30 access improvement projects were completed during the biennium—twice as many as in the previous biennium. Collaboration with local municipalities, counties, state and federal agencies, utility companies and paper companies led to contributions of land for new access areas and improvements.

Nine hunter education specialists joined the Division of Wildlife Enforcement. These specialists will enhance hunter knowledge and safety by developing a home-study and online safety course that ends with a field day of training and testing for hunter safety certification. In addition to enforcing wildlife regulations, officers are on call for law enforcement and rescue operations with other agencies. After the Sept. 11 terrorist attacks in 2001, the division assisted the U.S. Army Corps of Engineers with security needs.

The Pisgah Center for Wildlife Education served thousands of program participants and visitors during the biennium. As part of working toward construction of two more wildlife education centers, the division of Conservation Education reorganized to deliver its programs through three regional centers. Core staff assigned to the planned centers are already implementing outreach workshops and on-site programs with local conservation groups and educational institutions.

The Information Technology Section worked with staff from all divisions to add online licensing, vessel registration renewal and hunter education registration to the commission's Web site. Sales of fishing and hunting licenses are the key sources of funding for fish and wildlife programs, so these online improvements can enhance our fiscal resources.

Despite an economic downturn, the Division of Administrative Services managed those resources admirably. At the close of the biennium on June 30, 2002, the Wildlife Endowment Fund balance stood at $47,558,055. Since the inception of the Wildlife Endowment Fund in 1981, more than $23,658,000 in interest has been used to improve programs and services. The interest that accrues to this fund can be used for fish and wildlife programs; the principal helps to ensure the future for fish and wildlife management in North Carolina.

As we face the future, we know that cooperation and outreach will be increasingly important parts of our management efforts. As you read this report, you will encounter those two words often. Both mean interactions with individuals and groups. As our state becomes more densely populated and developed, those interactions can help us to balance the needs of people and wildlife.

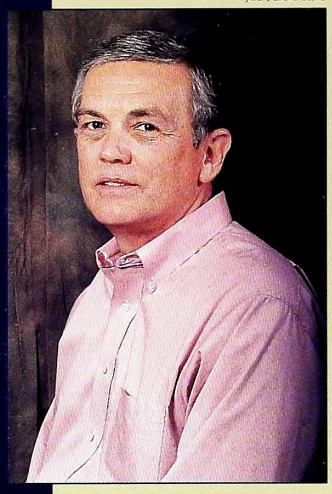
The North Carolina Wildlife Resources Commission

The Wildlife Commission manages more than 2 million acres of public lands that provide habitat for wildlife and recreational opportunities for outdoor enthusiasts. Fish and wildlife stocking and management programs ensure varied hunting and freshwater fishing experiences across the state. Other programs that focus on research and habitat conservation provide the basis for managing and conserving the game and nongame species that live on the state's land and in its waters.

The commission maintains more than 185 public boating access areas and 1,200 buoys and navigational aids statewide. Wildlife enforcement officers enforce the regulations that promote healthy wildlife populations and safe hunting, fishing and boating. And the administrative arm of the commission oversees vessel registration and titling as well as the sale of hunting and fishing licenses. All of these efforts require the cooperation of North Carolina's citizens. The Wildlife Commisson's sporting and conservation education programs help those citizens learn to use the state's wildlife resources safely and wisely.

John E. Pechmann, Chairman, Fayetteville
Wes Seegars, Vice-Chairman, Goldsboro
Gary Allen, Waxhaw
Charles W. Bennett, Matthews
Jim Bennett, Greensboro
Troy T. Boyd Sr., Elizabeth City
Polie Cloninger, Dallas
Russell Maughan Hull Jr., Elizabeth City
John F. Lentz, Ellerbe
W. Douglas Parsons, Clinton
Eugene Price, Goldsboro
Bobby Purcell, Cary
Dalton Ruffin, Winston-Salem
Bobby N. Setzer, Cullowhee
Berkley C. Skinner III, Rocky Mount
Charles Tolley, Marshall
W. Ray White, Manteo
Arthur J. Williams III, Washington
Stephen Windham, Winnabow

JODY DUGGINS



Fred Harris
Division Chief, Inland Fisheries

With North Carolina now the 11th most populous state in the nation, development and economic expansion can threaten the long-term sustainability of the state's aquatic resources. The Division of Inland Fisheries faces the challenge of managing the state's inland and anadromous fisheries and supporting ecosystems. During the biennium, the combined efforts of more than 80 dedicated staff members focused on these key areas: protecting important aquatic habitats, managing aquatic resources, increasing angling opportunities and public outreach.

PROTECTING IMPORTANT AQUATIC HABITATS

The Habitat Conservation Program staff reviewed more than 4,000 projects for developers and the agencies that issue development permits. They recommended ways to minimize adverse impacts on fish and wildlife resources from a wide range of projects. Major efforts included the following:

- Reviewed a draft mitigation plan for the wetland impacts of the Masons Inlet relocation and Figure Eight Island beach nourishment project.
- Worked with PCS Phosphate to protect wildlife resources in a proposed mining area in Beaufort County that includes 2,530 acres of wetlands and 49 acres of navigable creeks.
- Reviewed in-stream mining permits on the Dan River and recommended actions to alleviate adverse impacts on native fishes and other aquatic life.
- Worked with the Charlotte-Mecklenburg Utilities Division and the N.C. Department of Transportation to protect the federally listed Carolina heelsplitter, an endangered mussel.
- Provided advice on hydropower projects scheduled for relicensing by the Federal Energy Regulatory Commission (FERC), including Tapoco, Duke Power-Nantahala area and Gaston-Roanoke Rapids projects. Commented on other projects, such as the pending dam removal and breaching of Steeles Mill Dam in Richmond County, the surrender of the Cascade hydro project in Transylvania County and the surrender of the Idols hydro project in Forsyth County.
- Continued the stream restoration program, which restores and protects aquatic habitats in degraded streams. Engaged in contracts with the N.C. Department of Transportation to support restoration of nearly 60,000 linear feet of streams in western North Carolina. Almost 15,000 linear feet were restored during the biennium.
- Worked with the N.C. Department of Transportation to assemble an interagency team that focused on designing and implementing an ecologically sound wetlands and stream mitigation program. The Federal Highway Administration believes this approach could be a model used by other states.
- Participated in the Muddy Creek Watershed Restoration Initiative to obtain a second Clean Water Management Trust Fund grant for continued stream restoration in Burke and McDowell counties.
- Participated in multi-agency workgroups to define wetlands that cannot be effectively mitigated and to develop guidelines for implementing stream buffer rules.

MANAGING AQUATIC RESOURCES

The division's research examines the condition and abundance of fish stocks in the context of environmental conditions and manmade events. Fish populations are affected by harvest and regulation, and by interactions with other fish species, water-quality changes and extreme weather events, such as hurricanes. Research findings are used in developing management strategies. Likewise, research on angler-use patterns provides data for regulatory recommendations, fish-harvest allocations and planning. Research efforts during the biennium included the following:

- Conducted stock assessments and population investigations on reservoirs throughout the state for black bass, striped bass, crappie, walleye and channel catfish.
- Monitored the status of forage fish species in reservoirs where their availability may limit game fish populations.
- Investigated the effects of 1999 hurricanes and subsequent water quality on largemouth bass

in northeastern North Carolina. Largemouth bass abundance in 2001 in the Chowan River declined by 50 percent compared to pre-Hurricane-Floyd sampling in 1997. Extended periods of low dissolved oxygen followed the storms. Declining bass abundance in the Pasquotank and Perquimans rivers may have resulted from hurricane effects and increased salinity.

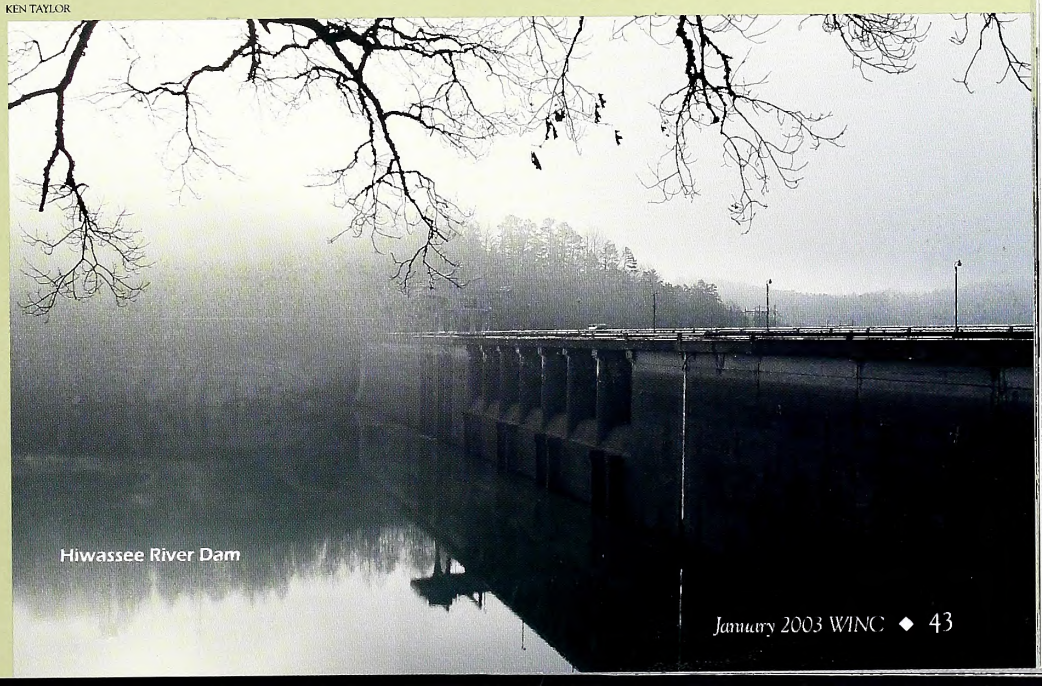
- Investigated the effects of bulkhead and rip-rap shoreline protection systems on fish assemblages in five coastal rivers. Fish were more abundant and diverse along shorelines protected by rip-rap than along shorelines with bulkheads. Results and recommendations were provided to the N.C. Coastal Resources Commission for consideration in developing shoreline protection policies.
- Conducted annual samplings of striped bass in the Roanoke, Tar, Neuse and Cape Fear rivers to determine if the number of larger, older striped bass returning to spawn is increasing. In rivers other than the Roanoke, the percentage of returning stocked fish is also being determined to evaluate their contribution to the population and to indicate stock abundance.
- Sampled American and hickory shad stocks in the Roanoke, Tar, Neuse and Cape Fear rivers to define the size and age structure of the shad populations and the relative numbers of males and females. Angler surveys conducted during the spring will estimate angler harvest and help biologists make decisions for regulating shad harvest.
- Confirmed the presence of largemouth bass virus in most of our river basins.
- Conducted creel surveys to examine angler-use patterns on seven western North Carolina reservoirs and to elicit opinions on management issues.
- Monitored the status of wild-trout populations in 17 streams over a seven-year period. The data revealed little change in population characteristics as compared to studies conducted in the 1970s.
- Examined angler use and satisfaction with the delayed-harvest trout regulation, which was changed in 1996 to include the months of October through May as a catch-and-release season. Fishing effort has tripled since delayed harvest began in 1992; estimates reveal that each stocked trout was caught four times. Angler satisfaction with the program has remained high, despite dramatic increases in fishing effort.
- Completed comprehensive fish and wildlife management plans for four river basins in western North Carolina: the Hiwassee, Little Tennessee, Tuckasegee and Nantahala. These plans comprise a vision for basinwide resource management that will be referred to in upcoming hydropower relicensing negotiations.
- Cooperated with N.C. State University to determine the energy requirements of striped bass in lakes Badin and Norman. This should help us understand the roles played by shad numbers as well as undesirably warm water in limiting striped-bass growth potential.
- Cooperated with biologists from Virginia Tech and Duke Power Co. to look at blue-catfish food habits, growth and movement in Lake Norman.
- Cooperated with Duke Power biologists to evaluate the effects of bait-bucket introductions of alewives and blueback herring into Lake Norman. Began sampling the lake's bass and crappie populations to determine how the herring would affect these game fish.
- Installed 29 fish attractors in Falls Lake and 19 in Jordan Lake. Identified brush shelters with buoys to help anglers locate them.
- Planted buttonbush, water willow, black willow and cypress trees near Gaston, High Rock, Norman and Jordan reservoirs.
- Worked with Carolina Power and Light Co. (Progress Energy) to plant 5,000 bald cypress and 2,800 tupelo trees around Sutton Lake.

"The combined efforts of more than 80 dedicated staff focused on the key areas of protecting important aquatic habitats, increasing angling opportunities, managing aquatic resources and public outreach."

—Fred Harris

The staff created comprehensive fish and wildlife management plans for the Hiwassee, Little Tennessee, Tuckasegee and Nantahala river basins that will be used in upcoming hydropower relicensing negotiations.

KEN TAYLOR



Hiwassee River Dam

KEN TAYLOR

KEN TAYLOR

MELISSA McGAW

The mobile aquarium (left) visited 62 events across the state. More than 1.3 million catchable-size trout (above) were stocked in cold-water streams during the biennium.

INCREASING ANGLING OPPORTUNITIES

The Wildlife Commission maintains 49 public fishing areas across North Carolina, but lack of access still limits angling opportunities for many citizens. The division improved access to bank fishing across the state and continued to enhance fish habitat:

- Completed a universally accessible fishing platform on the Tuckasegee River near Bryson City in cooperation with Swain County and the Tennessee Valley Authority.
- Completed additional access projects in cooperation with the U.S. Forest Service at Curtis Creek and with RiverLink at the French Broad River.
- Renovated the Bells Church Public Fishing Area at Jordan Reservoir to provide universal access to the pier and to stabilize 300 feet of eroded shoreline.
- Constructed a universally accessible pier, parking lot and launch ramp at Newbold Pond, part of the Barnhill Public Fishing Area.
- Constructed a universally accessible pier and renovated the launch ramp at McKinney Lake.

PUBLIC OUTREACH

The division's mobile aquarium debuted in September 2000 at a Cumberland County event and has since been displayed at 62 outreach events across the state where more than 210,000 people have had an opportunity to view cold-water and warm-water fishes in the aquarium's twin 300-gallon tanks. Other outreach accomplishments during the biennium involved expansion to existing programs:

- Expanded the Community Fishing Program to include 27 individual recreation cooperators with 40 bodies of water being intensively managed. Developed pier access for anglers with disabilities at the Harris Park and San-Lee Park Community Fishing Program sites.
- Expanded the Fishing Tackle Loaner Program to 39 sites across the state with rods and reels loaned more than 8,000 times.
- Cooperated in holding 132 Fish-for-Fun events statewide with approximately 9,800 participants. Partnered with industry to give away 155 fishing-related prizes, including four Comprehensive Lifetime Fishing Licenses to children.
- Updated the division's popular "Trout Fishing Maps" booklet and posted it to the Wildlife Commission's Web site.

FISH PRODUCTION

To support fish production, the following hatchery renovation projects were completed:

- Constructed a new hatchery building and water intakes, installed a water recirculation system, paved the roadways and fenced around the raceways at Armstrong Fish Hatchery.
- Installed liquid oxygenation systems at Pisgah, Marion and Armstrong hatcheries.
- Completed dam renovations at McKinney Lake Hatchery.
- Installed pond aeration systems at Watha Fish Hatchery.
- Upgraded the effluent system at Table Rock Fish Hatchery.

> "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."
>
> —Aldo Leopold (1887 – 1948)

Warm-Water Fishes Stocked

Species	Size	2000–2001	2001–2002	Total
Striped Bass	2-6"	1,140,087	860,686	2,000,773
Bodie Bass	2-7"	125,768	101,250	227,018
Largemouth Bass	3"	81,490	15,350	96,840
Redbreast	2"	427,100	60,000	487,100
Bluegill	2"	350,820	75,000	425,820
Redear	2"	83,500	22,500	106,000
Channel Catfish	4-16"	197,330	186,719	384,049
American Shad	Fry	308,000	1,369,000	1,677,000
TOTAL		**2,714,095**	**2,690,505**	**5,404,600**

Cool-Water Fishes Stocked

Species	Size	2000–2001	2001–2002	Total
Walleye	2-3"	30,000	30,000	60,000
Muskellunge	8-14"	247	931	1,178
TOTAL		**30,247**	**30,931**	**61,178**

Cold-Water Fishes Stocked (Catchable Trout)

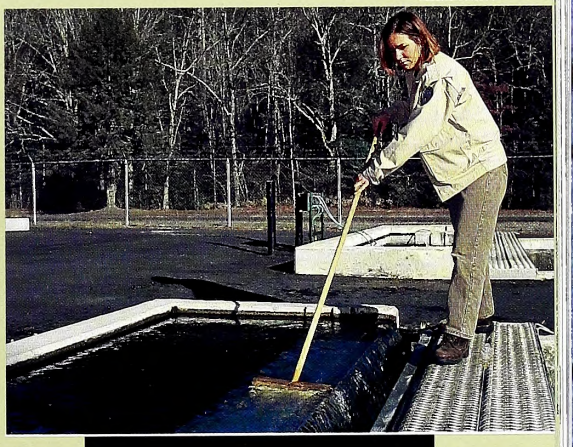
Species	Size	2000–2001	2001–2002	Total
Brook	Catchable	267,930	263,158	531,088
Brown	Catchable	125,274	145,983	271,257
Rainbow	Catchable	305,288	285,578	590,866
TOTAL		**698,492**	**694,719**	**1,393,211**

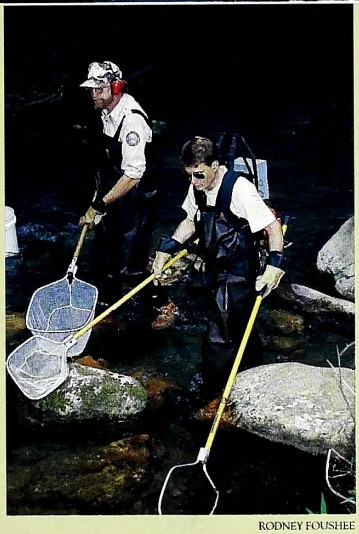
Cold-Water Fishes Stocked (Fingerling Trout)

Species	Size	2000–2001	2001–2002	Total
Brook	3"	5,000	1,000	6,000
Brown	3"	47,000	51,500	98,500
Rainbow	3"	22,000	15,000	37,000
TOTAL		**74,000**	**67,500**	**141,500**

The division's fish hatcheries produced more than 7 million fish for stocking the state's inland waters.

MELISSA McGAW





RODNEY FOUSHEE

Shocking is one technique used in the division's efforts to examine the condition and abundance of the state's inland fish species.

PLANS FOR THE NEXT BIENNIUM

- Increase our ability to accomplish stream restoration projects in eastern North Carolina.
- Restore and enhance fish and wildlife resources and ensure public-use opportunities by participating in the FERC relicensing process.
- Develop additional partnerships to improve aquatic and riparian habitats at the watershed scale.
- Provide timely, thorough reviews of development projects affecting fish and wildlife habitat.
- Manage fishery resources to provide angling opportunities for the public.
- Increase fishing opportunities in urban areas.
- Conduct angler opinion surveys to guide decisions on program directions and budgets.
- Renovate hatchery facilities.

JODY DUGGINS

Ginger Williams
Division Chief, Conservation Education

The Division of Conservation Education uses educational programs and publications to help people learn about wildlife and outdoor skills, and to encourage the wise use of wildlife resources. During the biennium, the division served some 35,800 participants, age 3 and older, through 1,774 workshops and special events across the state. *Wildlife in North Carolina* magazine continued to reach approximately 70,000 subscribers each month with articles about sporting traditions, wildlife and natural history.

In December 2001, the division reorganized to conduct its educational programs through three education centers. The success of the Pisgah Center for Wildlife Education led to plans for constructing two additional wildlife education centers during the next biennium. Together, these three centers will serve the state's Mountain, Coastal and Piedmont regions through on-site programming and field outreach. With the division's reorganization, its field education specialists assumed positions within each center to support regional programs. By the final quarter of the biennium, architectural plans were being developed for each planned center and core staff were in place. Three regional outreach specialists—one assigned to each wildlife education center—continued to implement Project WILD and CATCH workshops and outdoor skills experiences at parks, museums and schools.

PISGAH CENTER FOR WILDLIFE EDUCATION

The Pisgah Center for Wildlife Education in Transylvania County focuses on the state's mountain wildlife and their habitats through a visitor's center, exhibits and educational programs. More than 286,000 people visited the center during the biennium, and approximately 27,000 participated in 1,230 on-site programs. Activities included the following:

- Planned, advertised and held approximately 150 special events and group programs each quarter.
- Planned and held 49 field outreach programs since responsibility for regional coordination was assumed in December 2001.
- Coordinated activities with volunteers who contributed more than 7,000 hours to on-site and community activities involving wildlife and habitat conservation.
- Completed improvements to the exhibit loop, installed new fish feeders in the trout raceway exhibit and fabricated new signs for the habitat garden. Prepared for a classroom extension and remodeled the gift shop.

OUTER BANKS CENTER FOR WILDLIFE EDUCATION

The Outer Banks Center for Wildlife Education in Corolla will focus on the state's coastal wildlife and habitats, with a particular emphasis on barrier islands. Visitors to the center will also be able to learn about the traditions that depend on coastal wildlife, such as waterfowl hunting and fishing. Accomplishments included the following:

- Continued working on construction plans, exhibit design and acquiring artifacts.
- Continued working with staff in the Agency for Public Telecommunications to develop an instructional video.
- Forged partnerships with community organizations such as the Currituck Wildlife Guild and the Corolla Light Resort Community.
- Began implementing programs on-site and at Corolla Light Resort Community in spring 2002. Delivered 66 programs to more than 1,000 participants.
- Planned and held 90 field outreach programs since responsibility for regional coordination was assumed in December 2001.

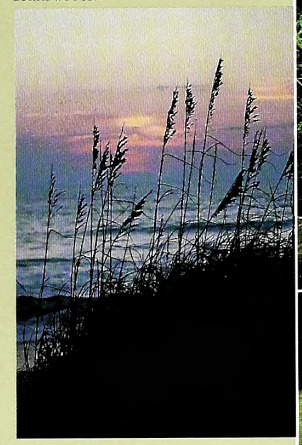
CENTENNIAL CAMPUS CENTER FOR WILDLIFE EDUCATION

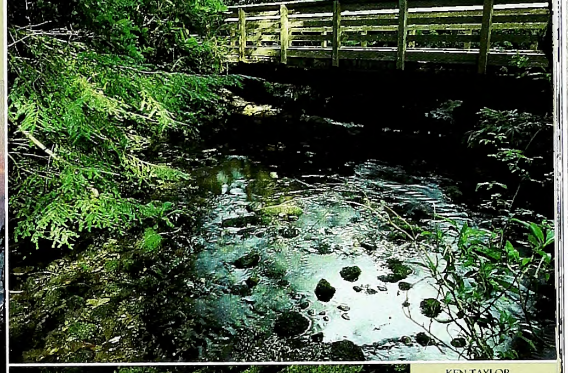
The Centennial Campus Center for Wildlife Education to be located on N.C. State University's Centennial Campus in Raleigh will focus on wildlife conservation in an urban environment. Because of its campus location, this center will serve as a wildlife education and research facility for educators and

students from both public schools and universities. It will also serve the public through programs and workshops. Tasks accomplished included the following:

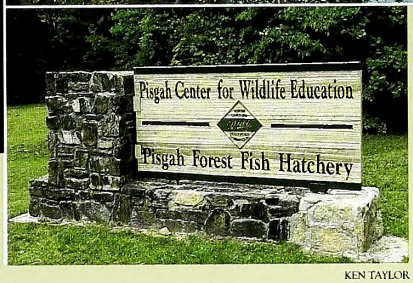
- Met with representatives from other Wildlife Commission divisions to discuss their involvement in exhibits.
- Established cooperative relationships with the center's Partnership Committee, including a subgroup interested in native plants and stream restoration on the site.
- Developed an exhibit design document and an estimated construction budget.
- Met with staff in the Agency for Public Telecommunications to develop an auditorium video and a documentary about the site management techniques to be used in the center's construction.
- Planned and held 82 field outreach programs since responsibility for regional coordination was assumed in December 2001.

CURTIS WOOTEN





KEN TAYLOR



KEN TAYLOR

The Pisgah Center for Wildlife Education served 286,000 visitors and some 27,000 program participants. Two new regional education centers are being planned for the Coastal and Piedmont regions.

BECOMING AN OUTDOORS-WOMAN (BOW)

This program focuses on teaching outdoor skills to women age 18 and older. During BOW weekends, participants choose from a selection of hands-on classes that teach outdoor skills—from archery and basic fly-fishing to firearms safety and stream ecology. Beyond BOW events focus on specific experiences, such as fishing, hunting and canoeing. Eighty-two women participated in two BOW weekends at Camp Cheerio in Alleghany County. Three Beyond BOW events served 45 participants through two deer hunts and a coastal experience that focused on fishing, island ecology and canoeing.

PUBLICATIONS

The Publications Section produces *Wildlife In North Carolina* magazine, creates products for the N.C. WILD Store and provides publication services to other divisions through a staff that includes writers, designers and a photographer. Highlights of the biennium included the following:

- Produced 24 issues of *Wildlife in North Carolina*, including special issues on the Sandhills region, water quality and quail-hunting traditions.
- Earned seven awards from the Association for Conservation Information for staff-written articles in *Wildlife in North Carolina*, the "2001 North Carolina Wildlife Calendar" and the "Salamanders of North Carolina, Part 1" poster.
- Added an editor to manage the publications needed by the education centers and other divisions.
- Produced 52 projects for the division, including posters and T-shirts for the N.C. WILD Store, program brochures and exhibit materials for the N.C. State Fair. Produced more than 70 projects for other divisions, including a calendar, brochures, booklets, signs, pins, T-shirts and forms.

"Knowledge about wildlife and outdoor skills must be taught through formal and informal educational programs that increase awareness of our environment and our connection to the natural resources we share."

—Ginger Williams

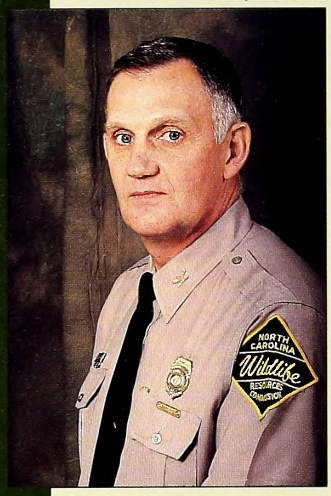
During the biennium, the division served some 35,800 participants, age 3 and older, through 1,774 workshops and special events across the state. Approximately 70,000 subscribers received Wildlife in North Carolina each month.

KEN TAYLOR

PLANS FOR THE NEXT BIENNIUM

- Begin constructing the Outer Banks and Centennial Campus centers for wildlife education.
- Continue educational outreach across the state through the wildlife education centers.
- Increase circulation of *Wildlife in North Carolina.*
- Concentrate on intensive public relations efforts that focus on wildlife-related issues.
- Promote the Wildlife Commission through the State Employees Public Image Campaign.

JODY DUGGINS



Col. Roger LeQuire
Division Chief, Wildlife Enforcement

The Division of Wildlife Enforcement enforces the hunting, fishing and boating regulations that protect the state's wildlife resources and the safety of its citizens. Enforcement officers also investigate boating and hunting accidents, and the division's education programs play an important role in preventing such accidents. When the state experiences emergency situations, officers in this division help other agencies with law enforcement and rescue operations.

OFFICER TRAINING

The 2000 Wildlife Enforcement Officers Basic Training School concluded in July 2000 with the graduation of 13 new wildlife enforcement officers. After graduating from the 19-week basic school, which consisted of more than 775 hours of training at the N.C. Justice Academy in Salemburg, these new officers each received an additional six months of field training under the guidance of a veteran wildlife officer.

The October 2000 selection process for the 2001 Wildlife Enforcement Officers Basic Training School began with more than 300 applicants, from which 14 were selected to begin training in March 2001. Twelve new officers graduated in July 2001 and completed the customary six-month field training experience. Due to few vacancies, a recruit school was not conducted during 2002. Planning began, however, for the next Wildlife Enforcement Officers Basic Training School to begin in March 2003.

In-service training continued to be an important aspect of wildlife law enforcement. Some training areas include firearms, law enforcement driving skills, defensive tactics, hazardous materials, blood-borne pathogens, juvenile sensitivity and CPR. Developmental supervision training was conducted for newly promoted supervisors, and officers continued to complete re-certification with the Intoxilyzer 5000 so they can process alcohol-related offenses.

EMERGENCY MANAGEMENT

As part of the State Emergency Response Team, wildlife enforcement officers assist with security and rescue efforts during emergencies. Fortunately, since Hurricane Floyd in 1999, no major hurricanes have made landfall in North Carolina. Wildlife enforcement officers have continued to participate in annual lake warning drills with the state's nuclear power plants and the Office of Emergency Management. Following the Sept. 11, 2001, terrorist attacks, the division assisted the U.S. Army Corps of Engineers with a request for additional security near the Falls Lake and Jordan Lake dams. Officers were posted in boats near both dams.

KEN TAYLOR

The annual hunter education shooting tournament is one of the most successful programs of its kind in the country.

HUNTER EDUCATION

The state's Hunter Education Program has undergone a period of redirection and growth during the past two years. Additional federal funding under the Pittman-Robertson Act was used to fund a hunter education specialist position in each of the nine Wildlife Commission districts. These specialists will implement a hunter education enhancement program: An Internet-based course is being developed so students can learn part of the course material online at their convenience. Each student will then have to attend a field day to complete hands-on training and testing. Advanced hunter education training such as archery and black powder courses are also included in the enhancement program as well as efforts to reach out to the Hispanic community. Other improvements during the biennium included the following:

- Online registration for hunter education classes was implemented using the Wildlife Commission's Web site to make hunter education more accessible and convenient for the public.

- Annual advanced hunter education instructor workshops were conducted to enhance instructor expertise and provide opportunities to network with fellow instructors. Hunter education classes are taught by a cadre of wildlife officers and volunteer hunter education instructors. The training and support of the volunteer hunter education instructors across the state continues to be a priority.
- Teaching teams were established throughout the state to allow additional hands-on training for students and to increase the quality of instruction.

The hunter education shooting tournament program continues to be among the most successful programs of its kind in the country. The program, which has been ongoing for 24 years, allows hunter education students to compete in shotgun, archery, rifle and hunter skills. Schools that instruct hunter education and 4-H teams are eligible to compete.

KEN TAYLOR

KEN TAYLOR

JODY DUGGINS

Wildlife enforcement officers enforce hunting, fishing and boating regulations. Airborne enforcement officers (right) survey wide areas of land for illegal activities, and they assist with tracking violators.

BOATING EDUCATION

The Boating Education Program continues to be a priority for the wildlife enforcement officers who teach boating safety in all 100 counties. In addition to implementing these classes, wildlife officers promoted boating safety by distributing promotional materials while on patrol and conducting courtesy boating inspections at advertised events. Educational campaigns were conducted during the biennium that focused on the importance of wearing personal flotation devices, avoiding alcohol while boating and boating education.

"In-service training continues to be an important aspect of wildlife law enforcement. Areas of training include firearms, law enforcement driving skills, defensive tactics and hazardous materials."

—Col. Roger LeQuire

CITATIONS AND WARNINGS ISSUED, 2000 AND 2001 *

Activity	Number Checked		Citations Issued		Warnings Issued	
	2000	2001	2000	2001	2000	2001
Hunting	79,781	70,775	7,593	7,462	1,974	793
Fishing	158,693	158,391	7,527	8,053	3,289	3,814
Boating	87,775	93,004	4,362	4,418	10,812	11,609
Total	326,249	322,170	19,482	19,933	16,075	16,216

** Statistics for 2002 were not complete at the time this report was compiled.*

MELISSA McGAW

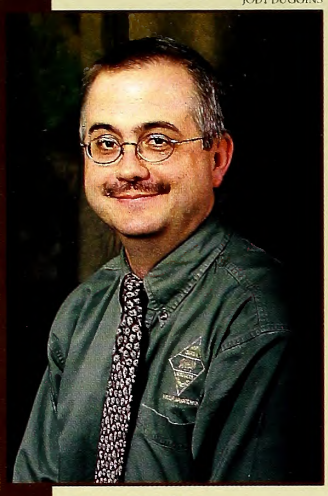
KEN TAYLOR

Wildlife enforcement officers (left) protect public lands from poachers who threaten populations of endangered plants and wildlife. Boating education (below) continues to be a priority in all 100 counties.

PLANS FOR THE NEXT BIENNIUM

- Enforce hunting and fishing rules and regulations vigorously for the benefit of people and wildlife.
- Enhance hunter and boater education programs through online options and information outreach.
- Reduce boating accidents and injuries through educational programs and enforcement efforts.
- Reduce hunting accidents and injuries through educational programs and enforcement efforts.
- Assist with security and rescue efforts in times of emergency.

JODY DUGGINS



David Cobb, Ph.D.
Division Chief, Wildlife Management

The Division of Wildlife Management does not look the same as it did 20, 10 or even two years ago. Even though its three-fold mission—to monitor wildlife populations, to develop and administer programs for the management and wise use of wildlife, and to improve human-wildlife interactions—hasn't changed, North Carolina has. As the state's population continues to increase and diversify, defining the answers to these guiding questions will be an ongoing process for the division's leadership: What kind of sporting opportunities do North Carolinians want? Is it possible to safeguard wildlife for future generations while fulfilling the desires of the current generation? What is the future of wildlife management in the 21st century?

In response, the division has placed new emphasis on interacting with the people it serves by adding two specialized positions and reorganizing the division. The two added positions include a human dimensions biologist and an outreach biologist. The human dimensions biologist designs, implements and analyzes surveys directed at hunters, game lands users and the public to scientifically determine their attitudes, needs and desires. The outreach biologist disseminates important information to the public about the division's activities, with a particular focus on building media relations.

The division's reorganization has streamlined programs and duties and created clearer lines of authority for the key responsibilities of land management, wildlife population research and regulatory action. North Carolina's development and urbanization has decreased traditional private hunting grounds and increased demand for public sporting areas. The division now has two sections to tackle this challenge: one that focuses on private lands and another that focuses on public lands. The newly structured Surveys and Research/Technical Guidance Section has three functions: monitoring and researching wildlife populations, cooperating with landowners to increase wildlife habitat on private lands and offering citizens guidance on a variety of wildlife issues. The Land Management Section continues to pursue acquisitions to the public game lands program and manage game lands for sporting recreation and the sustainable use of wildlife resources. Two additional management units complete the division: the Regulations and Special Projects Unit and the Federal Aid and Permits Unit. The new division structure rests on this goal—to provide the greatest amount of service possible to North Carolinians.

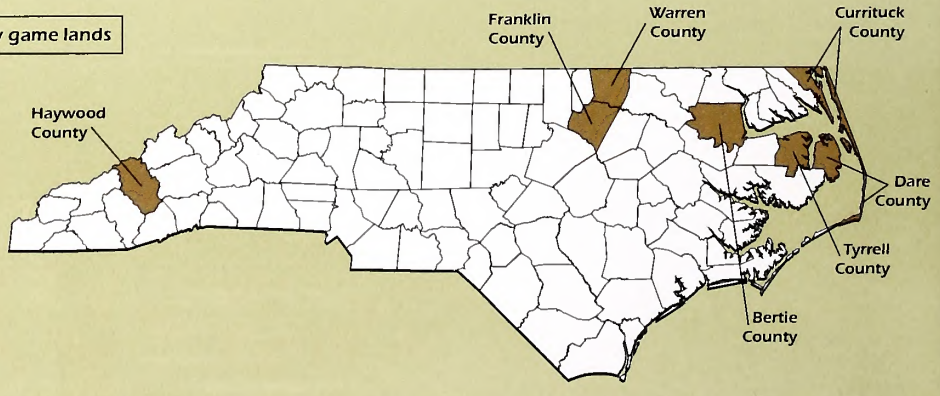
LAND MANAGEMENT

During the past biennium, the Land Management Section added 24,950 acres to the Game Lands Program. This acreage includes six entirely new Wildlife-Commission-owned game lands with a collective total of 12,924 acres in seven counties:

- Shocco Creek, 1,625 acres in Warren and Franklin counties
- Van Swamp, 5,482 acres in Bertie County
- Currituck Banks, 182 acres in Currituck County
- J. Morgan Futch, 600 acres in Tyrrell County
- Cold Mountain, 3,295 acres in Haywood County
- Roanoke Island Marshes, 1,740 acres in Dare County

Four game lands have focused on creating early-successional habitat in conjunction with the Cooperative Upland-habitat Restoration and Enhancement (CURE) Program: Sandhills, Suggs Mill Pond, Caswell and South Mountains. The staff on these game lands use timber thinning, herbicides and fire to maintain the habitat preferred by quail, rabbits, other small game and grassland songbirds on selected portions of the game lands.

Locations of new game lands



SURVEYS AND RESEARCH/TECHNICAL GUIDANCE

The biologists assigned to this section are primarily responsible for implementing the CURE Program. Since its inception in 2000, CURE has enrolled more than 40 landowners with a total of about 16,000 acres on three cooperatives in the state. The initial goal of the program was to convert or enhance more than 2 percent of the enrolled acreage into early-successional habitat, but the program had almost quadrupled that amount by the end of the biennium. Landowners have been very enthusiastic about the CURE Program, and early data on its success are promising.

The Nongame and Endangered Wildlife Section has been folded into the Surveys and Research/Technical Guidance Section to become the Faunal Diversity Program. The Faunal Diversity Program will particularly benefit from new federal monies available to the state through the State Wildlife Grants Program and the Wildlife Conservation and Restoration Program.

"The division has streamlined programs and created clearer lines of authority for the key responsibilities of land management, wildlife population research and regulatory action."

—David Cobb

HIGHLIGHTS

Both game and nongame species have benefited from the division's efforts during the biennium. Through the wild turkey restoration project, 30 years of restoration efforts have increased the statewide population from 2,000 birds to 130,000 birds. A total of more than 5,400 wild turkeys have been relocated to more than 325 restoration sites in North Carolina, and the Wildlife Commission's wild turkey restoration project is complete.

Wild turkeys now exist in all 100 counties of the state. Although a few supplemental releases will be made in the next several years, the wild turkey project's major focus will now shift to a new phase of habitat and harvest management. The reported harvest is now near 8,500 birds and continues to climb rapidly.

The CURE Program provides an example of how efforts to address habitat loss converge to benefit game populations as well as nongame wildlife. Early-successional habitat created on private and public lands through the CURE Program will benefit important game species and declining songbirds as well.

As ground-nesters or birds that nest in low vegetation, the bobwhite quail, loggerhead shrike, eastern meadowlark and other birds are extremely vulnerable to disturbance and the lack of shrubby cover. The CURE Program will create nesting, foraging and cover habitat through several management techniques: encouraging the growth of natural vegetation field borders, planting and managing native warm-season grasses, thinning forested areas and using fire to create and maintain low-growing vegetation. Even though the focus for this habitat improvement involves the three CURE cooperatives and four game lands, the techniques and lessons learned will benefit landowners across the state. (For a map showing the CURE Program focal areas, see the next page.)

Two new federal grant programs—the State Wildlife Grants Program and the Conservation and Restoration Program—enabled the division's Faunal Diversity Program to provide more research and conservation opportunities. A conservation easement and mineral rights acquisition on the Cranberry Iron Mine, an inactive mine in Avery County, will provide undisturbed hibernation for five species of bats, including the Virginia big-eared bat, a federally-listed endangered species. The Cranberry Iron Mine is one of only two known hibernacula in North Carolina for the Virginia big-eared bat, and the Wildlife Commission easement was an important conservation success.

The Land Management Section added 24,950 acres to the Game Lands Program, including six entirely new game lands.

LAWRENCE S. EARLEY

MELISSA McGAW

JODY DUGGINS

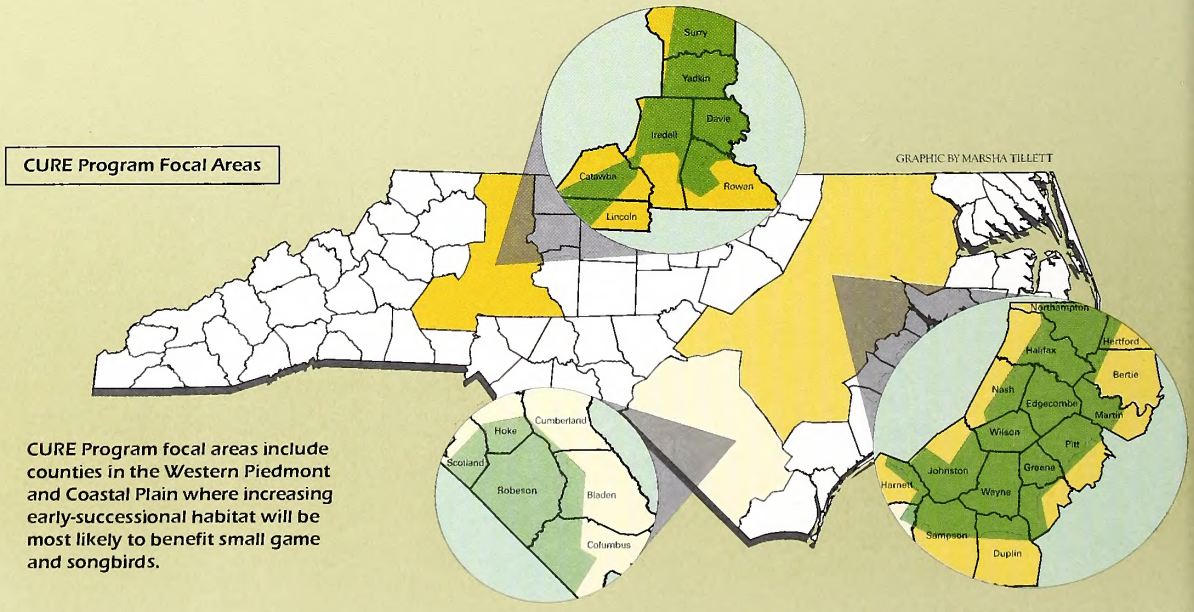
KEN TAYLOR

Acquisition of land in Wilkes County will increase habitat for the southern bog turtle (top left). The CURE Program increased early-successional habitat on private lands (left). Because of restoration efforts, wild turkeys now occur in all 100 counties of the state (above).

HIGHLIGHTS *(continued)*

Strides were also made toward enhancing the population of another mountain species, the southern bog turtle, including purchasing habitat in Wilkes County. A project to implant PIT tags (tiny microchips for identification) will help to deter wild bog-turtle poaching and aid in prosecuting poachers. Poaching is a serious threat to southern and northern bog turtles.

On the coast, efforts were made to conserve habitat for colonial nesting waterbirds. Although many species of colonial nesting waterbirds are doing well, populations of common terns, black skimmers and gull-billed terns are declining sharply. The Wildlife Commission acquired a new dredge-spoil island to create nesting habitat. In addition, the Division of Wildlife Management will increase research and conduct surveys to define the problem of declining populations and develop new solutions.



CURE Program focal areas include counties in the Western Piedmont and Coastal Plain where increasing early-successional habitat will be most likely to benefit small game and songbirds.

Source: N.C. Wildlife Resources Commission

PUBLICATIONS

The division produced two new public information booklets:

- *Special Hunt Opportunities in North Carolina* outlines how to select, apply for and locate special hunt opportunities, including many hunt types not available prior to the 2002–2003 hunting season.
- "2002–2003 Game Lands Dove Fields" provides a locator map and description, by region, of the dove fields on game lands.

RESEARCH

The division's ongoing research efforts focus on both game and nongame species, and they involve a variety of research methods. Data collected through hunter harvest reports and scientific observation, marking and tracking are used to develop population distributions that inform management decisions. Other research efforts involve surveys directed at hunters, property owners and game lands users to define their wildlife-related preferences and concerns. Research advances during the biennium included the following:

- Surveyed landowners' attitudes for the CURE Program in cooperation with N.C. State University and an environmental survey research firm. The findings will be used to guide the CURE program across the state.
- Continued to estimate black bear population levels using DNA marking and recapture. Hunters play a critical role in efforts to estimate population levels in areas designated for black bear management.
- Continued ongoing tundra swan migration tracking to gain a better understanding of annual survival rates, local wintering-ground movements, migration chronology and key breeding areas.
- Implemented population reconstruction for white-tailed deer. Although the statewide population is considered stable, the trend in most Coastal Plain, southern Piedmont and southern Mountain region herds is stable to slightly declining; the trend in the northern Piedmont and northern Mountain region is generally increasing.
- Developed habitat prediction models for northern flying squirrels. These models will help to determine the range of this endangered species and inform efforts to protect and enhance its habitat.

MONITORING

Ongoing efforts to monitor game and nongame species continued throughout the biennium:

- Continued surveys of avid quail and grouse hunters. These surveys provide data that assists the division's biologists with monitoring game bird populations and harvest rates.
- Designed and implemented a system to monitor songbird population trends on state-owned game lands throughout western North Carolina.
- Expanded songbird and bobwhite quail monitoring to CURE Program areas, both privately and publicly owned.
- Checked 850 northern flying squirrel nest boxes annually to monitor habitat use.
- Monitored and surveyed for populations of freshwater mussels in various river systems, with a particular focus on the Little Tennessee and French Broad river basins, where populations of endangered and threatened mussel species occur.

PLANS FOR THE NEXT BIENNIUM

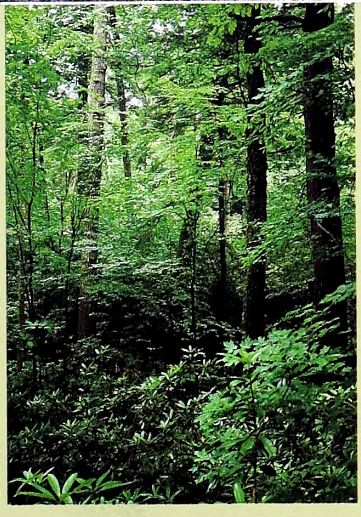
- Expand current game lands and add new lands to the program.
- Continue to make strides in the CURE Program.
- Expand biological knowledge by hiring more species specialists, including a herpetologist.
- Strengthen our constituency ties and reach out to new constituents.

"The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value."

—Theodore Roosevelt (1858 – 1919)

Wildlife biologists use DNA marking and recapture to estimate black bear populations across the state.

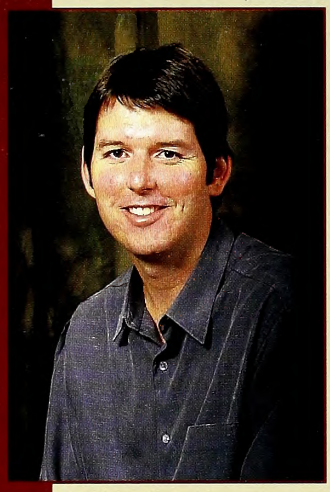
MELISSA McGAW



KEN TAYLOR

Acquisitions of new game land acreage increased habitat for both game and nongame species.

JODY DUGGINS



Gordon Myers
Division Chief, Engineering Services

The Division of Engineering Services provides planning, design, construction and operational support to the Wildlife Resources Commission. Primary program areas include public boating access, waterway marking and capital improvements. The engineering support provided to other divisions within the Wildlife Commission reduces redundant efforts and improves efficiency.

IMPROVING BOATING AND FISHING ACCESS

The division increased productivity during the biennium while raising the threshold for facility design and performance. Although many accomplishments were made in each program area, substantial emphasis was placed upon boating access. Division staff conducted a statewide facility assessment in 1999. This assessment led to the Boating and Fishing Access Improvement Plan approved by the Wildlife Resources Commission in October 1999. Based on the improvement plan, the division added staff during the biennium: five boating-access maintenance technicians and three field-based regional engineers. These staff additions created a framework for regional self-sufficiency and improved program efficiency.

The division doubled the number of completed projects within this biennium as compared to the previous one. This production increase was distributed statewide. The table on the next page summarizes the access projects completed during the biennium.

MELISSA McGAW

Five new boating access areas were constructed during the biennium.

DEVELOPING PARTNERSHIPS

Cost-sharing and collaboration likewise marked the division's activities during the biennium. Partnership development offered new opportunities to involve project stakeholders in both the construction and operation of boating and fishing access areas. These collaborative relationships resulted in almost $500,000 in direct contributions. Moreover, many of these contributions are recurring revenues that will further our ability to enhance programs.

Other valuable partnerships included cooperation with local municipalities, counties, state agencies, federal agencies, power companies and paper companies. Most of these partnerships involved donations of valuable waterfront property for boating access development. Nearly all boating access facilities are developed on land donated or leased to the Wildlife Resources Commission at nominal cost. These vital contributions extend our ability to develop new facilities.

INSPECTING NAVIGATION AIDS

In addition to providing access to the state's waters, the division also supports water safety through its Aids to Navigation Program. Division staff maintain more than 1,200 navigation aids located on 80 bodies of water. All navigational aids were inspected at least twice a year during the biennium. The staff also provided technical guidance to local governmental units, lake management authorities and other state agencies. Most guidance involved marking-rules interpretation and the evaluation of proposed marking strategies.

COORDINATING CAPITAL PROJECTS

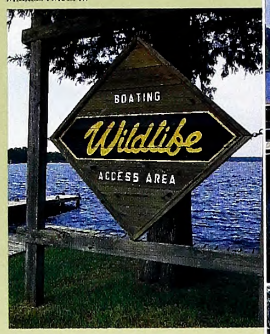
The division is responsible for coordinating all of the Wildlife Commission's capital projects. Specifically, the staff manages and delivers all architectural and engineering services. Activities include serving as the agency liaison with the State Construction Office, State Property Office, designers and contractors. During the biennium, the Wildlife Commission continued to accelerate its investment in support infrastructure. Additionally, the division's Capital Projects Program expanded to include management of all land acquisitions. To meet this challenge, a full-time capital projects coordinator was added to the staff. Elements of financial management, land acquisition and project management have been integrated into this position.

The division managed approximately 15 capital projects during the biennium. The largest included major renovations at Armstrong State Fish Hatchery, dam remediation at McKinney

Lake State Fish Hatchery and design services coordination for two projects: the Outer Banks Center for Wildlife Education and the administrative headquarters to be located on Centennial Campus at N.C. State University, which will include a regional center for wildlife education.

The division also provided design and construction support for miscellaneous projects. Notable projects included construction of a trap-and-skeet field and other range improvements at the John Lentz Hunter Safety Education Center in Richmond County, design and construction assistance for five public fishing access areas and depot improvements at the Balsam and Marion depots.

MELISSA McGAW



JODY DUGGINS

KEN TAYLOR

The division manages and delivers architectural and engineering services for all of the Wildlife Commission's capital projects.

PLANS FOR THE NEXT BIENNIUM

- Continue to develop new partnerships and maintain existing partnerships to address boating access needs.
- Participate actively in the FERC relicensing process to help ensure that boater needs are addressed.
- Strive to make technical assistance available to local governments.
- Protect water quality by enlisting the participation of boaters and marina operators in the Clean Vessel Act Grant Program.
- Enhance the Aids to Navigation Program by establishing a dedicated waterway marking crew.

"The division increased productivity during the biennium while raising the threshold for facility design and performance."

—Gordon Myers

BOATING ACCESS AREA IMPROVEMENTS

Access Area	County	Body of Water
New Facilities Constructed		
Aurora	Beaufort	South Creek
Straits Landing	Carteret	The Straits/North River
Edenton	Chowan	Albemarle Sound
Surf City	Pender	Atlantic Intracoastal Waterway
Lemmon's Branch	Swain	Fontana Lake
Major Renovations Completed		
Smith's Creek	Beaufort	Smith's Creek/Campbell's Creek
Holden Beach	Brunswick	Atlantic Intracoastal Waterway
Jackrabbit	Clay	Lake Chatuge
Stumpy Point	Dare	Stumpy Point Bay/Pamlico Sound
Pollocksville	Jones	Trent River
Snow's Cut	New Hanover	Atlantic Intracoastal Waterway
Triple Springs	Person	Mayo Reservoir
New Docks Added		
Pine Creek	Jackson	Lake Thorpe
Powerhouse	Jackson	Lake Thorpe
Sawpit Landing	Pender	Northeast Cape Fear River
Grifton	Pitt	Contentnea Creek
High Hill	Robeson	Lumber River
Docks Improved		
Cedar Point	Carteret	Atlantic Intracoastal Waterway
Bridgeton	Craven	Neuse River
Mashoes Landing	Dare	East Lake
5th Street Landing	Halifax	Roanoke Rapids Lake
Shell Rock Landing	Onslow	Atlantic Intracoastal Waterway
Launch Ramps Replaced and Repaired		
Hunts Bluff	Bladen	Black River
Fayetteville	Cumberland	Cape Fear
Kenansville	Duplin	Northeast Cape Fear River
Wolf Creek	Jackson	Wolf Creek Lake
Sutton Lake	New Hanover	Sutton Lake
Parking Area and Access Road Improvements		
Coinjock	Dare	Atlantic Intracoastal Waterway
5th Street Landing	Halifax	Roanoke Rapids Lake
Choga Road	Macon	Nantahala Lake

Division staff inspect and maintain more than 1,200 navigation aids on 80 bodies of water across the state.

KEN TAYLOR

JODY DUGGINS

Cecilia Edgar
Deputy Director for
Administrative Services

The Division of Administrative Services provides administrative and technical support to the Wildlife Resources Commission through financial management, purchasing, human resources, information technology systems and customer support services. Customer services to the public include hunting and fishing license sales and vessel registration and titling. During the biennium, the division improved the services it provides to the Wildlife Commission and the public.

FINANCIAL MANAGEMENT

The Finance Section handles the accounting, budgeting and payroll functions for the commission. A systems accountant position was added to oversee the Wildlife Commission's interest in the state of North Carolina's accounting system and the supporting systems that affect the commission's financial status. Section staff were involved in several major projects during the biennium:

- Participated in planning discussions for the Outer Banks Center for Wildlife Education and an administrative building on Centennial Campus at N.C. State University. Discussions about financing these large-scale projects involved the Department of the State Treasurer, the Office of the State Controller and the Office of Budget and Management.
- Assisted with implementing a new Web-based statewide purchasing system by providing the accounting framework and controls.
- Provided the accounting framework and controls for the online customer service applications developed during the biennium. These controls will ensure that these applications properly account for all financial transactions.
- Participated in developing the Wildlife Commission's Intranet site to provide employees across the state one location from which to access policies, benefits, forms and news. The section maintains the site.

KEN TAYLOR

Services to the sporting public continue to improve through technology.

PURCHASING AND WAREHOUSE

The Purchasing Section implemented new systems for both purchasing and inventory, and a permanent position was added to assist in handling increased purchasing demands.

- Implemented a new statewide, Web-based purchasing system that required extensive training, technical guidance and retooling of practices to fit the system to each division's needs. The Wildlife Commission was commended for its quick command of the e-procurement system.
- Implemented new warehouse inventory software that provides additional information and reports on withdrawals. Reviewed use of inventory items by division to determine the benefits of continuing to stock each item. Fine-tuning the inventory created a more efficient and safer work environment so warehouse staff can better serve users.

CUSTOMER SUPPORT SERVICES

This section's primary goal is to serve the public and the wildlife service agents who provide point-of-sale assistance with hunting and fishing licenses, vessel registration and vessel titling. During the biennium, the Wildlife Commission's Web site became a more important primary link to both agents and customers. The division added an assistant manager position to manage the day-to-day activities of the licensing and vessel section, allowing the manager more time to focus on long-term planning and to expand the opportunities customers have to purchase products through e-commerce.

- Implemented online vessel renewal, licensing and product sales. The staff also participated in the design and testing of these Web-based customer-service applications.
- Documented the business requirements for a new vessel system. This will be used by the Information Technology Section to design a new vessel database and application for register-

ing and titling vessels. The staff and the agency legal counsel revised and streamlined vessel rules and regulations to incorporate changes that would affect the new application.

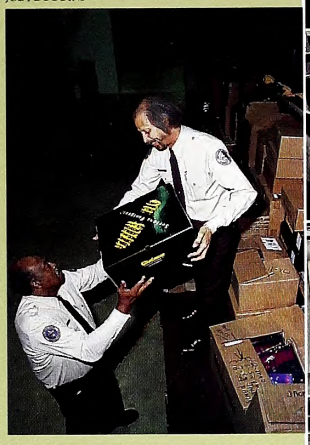
- Assumed management of the waterfowl print-and-stamp program and fulfillment of N.C. WILD Store products to better serve customers and reduce contracting costs.

SYSTEM TECHNICAL SUPPORT

The Information Technology Section worked with staff from all divisions to completely redesign the Wildlife Commission's Web site based on this overall objective: to make as much information as possible available to the public.

- Created applications for online licensing and vessel registration renewal, allowing customers to purchase licenses and renew their vessel registration by credit card from a computer.
- Added several search features to the Web site, along with online registration for hunter and boating safety classes and lifetime licensing postcard response.
- Assumed complete responsibility for the automated licensing system in 2001. Transitioning support for this system from Electronic Data Systems (EDS) has reduced expenses while offering a higher level of service to agents and customers.

JODY DUGGINS



JODY DUGGINS

JODY DUGGINS

Customer Support Services staff assumed new responsibilities to better serve customers (top right). Warehouse staff began using a more efficient inventory system (above). System Technical Support staff created applications for online licensing and vessel registration renewal (right).

HUMAN RESOURCES

The Personnel Section focused its efforts on expanding service to the Wildlife Commission's employees through performance management, training and safety programs:

- Revitalized the performance management program to provide more training to managers, supervisors and other employees as part of an overall goal—encouraging teamwork to define and measure performance outcomes.
- Implemented a Wildlife Leadership Development Project for developing future leaders through management training for new supervisors and those who desire to move into management. The project uses training modules from Development Dimensions International, a nationally recognized provider of management training solutions.
- Enhanced employee safety through an active Safety and Health Committee. From 2000 to 2001, workers' compensation expenses were reduced by approximately $70,000.
- Conducted an education effort that focused on the N.C. Flex program. Rising health insurance costs continue to have a negative impact on many employees, and this program is one solution. The Wildlife Commission received an Outstanding Achievement Award in 2001 for increased participation.

"As technology is used to make operations more efficient, we are improving the administrative services we provide to the Wildlife Commission and the public."

—Cecilia Edgar

Licenses can now be purchased online, by phone, by mail and by visiting the Wildlife Commission or one of its agents.

MELISSA McGAW

PLANS FOR THE NEXT BIENNIUM

- Retool the current cost-center structure to track and report project expenditures and revenues more efficiently.
- Develop flexible and reliable applications for automated licensing and vessel registration to replace existing systems.
- Continue to enhance employee development programs through leadership training.
- Expand Web site information and online options for purchasing licenses and products, renewing vessel registrations and taking advantage of the Wildlife Commission's many educational opportunities and special programs.

ENDOWMENT FUND

	Interest	Principal
2000–01	2,782,551.95	2,320,816.54
2001–02	3,065,685.17	2,615,782.57
Total Interest and Principal	$ 5,848,237.12	$ 4,936,599.11

SPECIAL REVENUE FUND

Revenues July 1, 2000 – June 30, 2002

	2000–01	2001–02
Hunting & Fishing Licenses	14,391,232.28	14,677,853.32
Vessel Registrations	3,093,605.00	3,256,466.03
Watercraft Titling	326,530.50	319,087.00
Federal Funding	8,213,564.00	8,361,861.00
Transfer – Revenue (Nongame Checkoff)	470,341.74	395,274.02
Transfer – Revenue (Sales Tax)	12,206,053.24	12,900,455.08
Transfer – Revenue (Gas Tax)	1,408,458.00	1,522,133.00
Transfer – Dept. of Transportation WRC License Plate Sales	15,030.00	11,470.00
Transfer – Dept. of Transportation	324,437.15	275,900.00
Transfer – Dept. of Environment & Natural Resources (DENR)	1,406,481.00	1,350,221.00
Transfer – Dept. of Administration	495.00	
Transfer – Endowment Fund	949,387.00	1,606,387.00
Transfer – Dept. of Crime Control & Public Safety	78,372.00	536,000.29
Transfer – Capital Improvements		115,763.99
Sale of Publications	723,807.95	557,450.20
Sale of Timber Products	922,231.01	1,420,248.47
Sale of Surplus Property	142,858.05	113,039.74
Fees, Licenses & Fines	179,728.78	156,799.69
Food & Vending	19,016.60	17,908.72
Professional Services	133,918.51	245,206.34
Other Sales of Goods & Services	218,432.34	176,123.14
Reimbursement – Dept. of Transportation	508,059.00	376,305.00
Reimbursement – Miscellaneous	2,920.73	584.54
Rental of State Property	74,085.54	24,551.20
State Grant – DENR Stewardship Program	149,000.00	144,000.00
State Grant – Clean Water Trust Fund	127,531.42	246,687.66
State Grant – Natural Heritage Trust Fund	128,333.00	
Private Grants	40,000.00	
Beaver Damage Control – County Funds	160,000.00	152,000.00
Local Funds	30,845.68	36,311.08
Interest Income – Short Term	462,444.63	695,059.22
Private Donations & Gifts	51,457.07	57,728.78
Miscellaneous	120,033.53	79,619.94
Total Revenues	$47,078,690.75	$49,828,495.45

The Wildlife Commission serves the public through many programs, including a Web site, education efforts, licensing and wildlife-related products.

Cooperation and Outreach

The Division of Administrative Services implemented online vessel registration renewal, license sales and product sales to make these services more convenient for the public.

The Division of Conservation Education presented 479 outreach workshops and events across the state that served 7,392 participants. Project WILD and CATCH workshops showed adults how to incorporate wildlife in school curricula and youth group activities. Outdoor skills events offered adults and young people experiences with outdoor activities.

The Division of Engineering Services cooperated with local municipalities, counties, state agencies, federal agencies, power companies and paper companies to acquire waterfront property for developing additional boating access areas for the state's citizens. Access areas are constructed and maintained through cooperation with counties and municipalities.

The Division of Inland Fisheries worked with state agencies, federal agencies and local organizations to review mitigation plans, mining permits and hydropower relicensing applications that might affect the state's streams and wetlands. The staff also participated in multi-agency projects to improve streams and wetlands.

The Division of Wildlife Enforcement made hunter education more accessible and convenient for the public by implementing online registration for hunter education classes via the Wildlife Commission's Web site (www.ncwildlife.org).

The Division of Wildlife Management relied on cooperation from hunters in its research efforts. The information provided by hunters about their hunting trips and the animals they harvest helped wildlife biologists to monitor populations of deer, black bears, upland game birds and waterfowl.

All of these divisions worked together each year to build an outreach exhibit at the North Carolina State Fair. The 2000 State Fair exhibit, "After the Storm," depicted an uprooted tree in a floodplain forest to explore a hurricane's effects on wildlife communities. The 2001 exhibit presented information about "Supplementing Nature's Habitats" by depicting techniques used to enhance streams and manage land for wildlife.

> "The economy of nature, its checks and balances, its measurements of competing life—all this is its great marvel and has an ethic of its own."
>
> —Henry Beston (1888 – 1968)

N.C. WILDLIFE RESOURCES COMMISSION

"We will be known
by the tracks we leave behind."

—Dakota proverb

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

N.C. WILD STORE

Winter weather? Don't despair. Explore the wild from your favorite chair.

What's that little snake with a red belly?

The redbelly snake is one of North Carolina's smallest snakes; it ranges from just 6½ to 12 inches. Although it doesn't bite, it can curl its upper lips in a snarling manner. Is it the little snake in your garden? Our new snake posters can help you identify the snakes you encounter and appreciate the role each one plays in nature. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for venomous and protected species. As a set, the two posters cover all of North Carolina's 37 snake species.
Each poster is 24" x 36".

redbelly snake (Storeria occipitomaculata)

Each poster may also be purchased separately.

LIVEBEARERS
$6 ITEM CODE **P5**

EGG-LAYERS
$6 ITEM CODE **P8**

SNAKES OF NORTH CAROLINA POSTER SET
$10 ITEM CODE **P26**

Rivers of Life

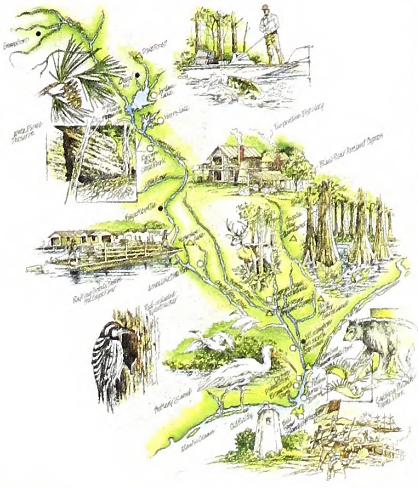
Sale

The natural history of North Carolina's rivers spans millions of years, but our choices for the next few decades will determine their survival. Published in Nov. 1999, this special issue of *Wildlife in North Carolina* chronicles the history and prospects of the state's 17 major river basins. Some of the state's finest outdoor writers and photographers are represented in this 128-page guide to the rivers that link people to each other and wildlife. Includes maps, graphics and a list of organizations that can help you to become a river crusader.

Now at a special price while quantities last.

RIVERS OF NORTH CAROLINA
$5 ITEM CODE **M11**

Cape Fear River Basin



Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Each poster can also be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

Amphibians: Frogs of North Carolina Poster Set

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Each poster can also be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

Embroidered Caps

Wildlife in North Carolina Caps
Exclusive designs and magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Each poster can also be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Items not pictured:

All Things Are Connected

Video and Activity Guide. Based on Chief Seattle's 1855 speech, the film's focus is on environmental ethics. Accompanied by *This Land Is Sacred* teacher's guide, this film is a must-see for everyone. $22 ITEM CODE **W3**

Bird Houses and Feeders

This 8-page illustrated guide to building birdhouses includes construction notes and dimensions, as well as tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE **M6**

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE **M2**

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set.
$2 ITEM CODE **M5**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

Largemouth Bass. Add some history to your fishing trips with our bass tee. This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12XLG** (extra large)
A12LRG (large) **A12XXL** (extra extra large)

left front design

Snow Geese. Our waterfowl tee recalls times past, when the Cape Hatteras lighthouse stood close to Diamond Shoals. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front. Celebrate conservation efforts with this white, all-cotton tee.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

Wild Turkey. A timeless spring scene makes this tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo. Grab a gobbler with this tan, all-cotton tee.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

Sporting Dogs of North Carolina Poster Set

These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail their quarry and some that tree as well.
Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams.
Each 22" x 34" poster is sold separately.

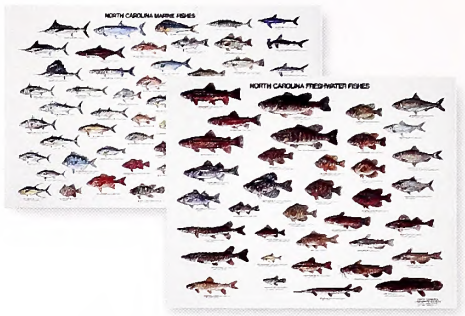
Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**

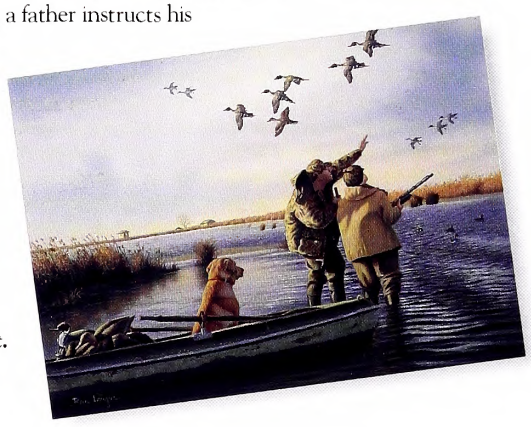


2002 Migratory Waterfowl Print and Stamp Set ▼

Dawn breaks, and a flock of pintails settles on the brackish waters of Pamlico Point. In the gray light, a father instructs his son to focus on just one bird before shooting. Signed by artist Ron Louque, "Traditions at Pamlico Point" will stir memories of a first hunt for many a waterfowler. Your purchase of this limited-edition set supports wetlands research and restoration. Overall size: 12" x 14"; image size 6 1/2" x 9".

This item not subject to 15% discount.

$145 ITEM CODE **DSP02**



Dogs that Point, Fish that Bite ▼

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

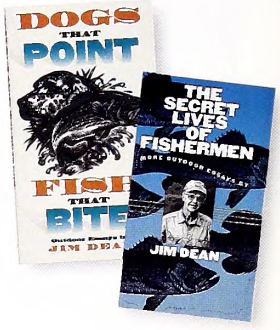
Hardbound $19.95
ITEM CODE **M8**

Paperback $10.95
ITEM CODE **M12**

The Secret Lives of Fishermen ▶

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound $24.95
ITEM CODE **M13**



North Carolina WILD Places: A Closer Look ▶

Book and Posters Set.

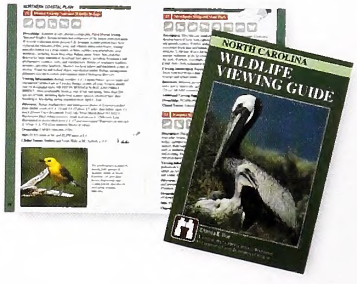
Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a N.C. WILD Places map featuring the art of Jackie Pittman make this set a valuable teaching tool.

$16 ITEM CODE **E6**

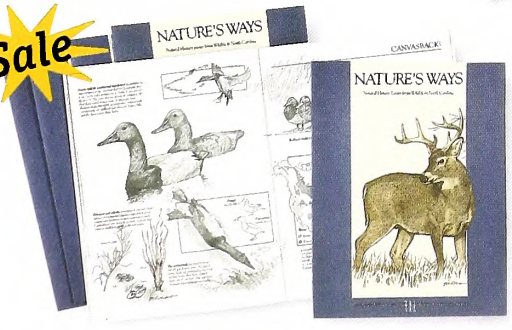
North Carolina Wildlife Viewing Guide ▼

From Cape Hatteras to the Great Smokies, the *North Carolina Wildlife Viewing Guide* will lead you to 90 of the state's premier wildlife viewing locations—and better your chances of seeing wildlife once you get there.

$5.95 ITEM CODE **N6**



Sale



Nature's Ways Collection ▲

If you're looking for drama and science combined, "Nature's Ways" essays from *Wildlife in North Carolina* will deliver. Includes a new comprehensive index to all six volumes so you can find related essays easily.

Half-price while they last.

Boxed Set. $15 ITEM CODE **M10**

Unboxed set. $13.75 ITEM CODE **M9**

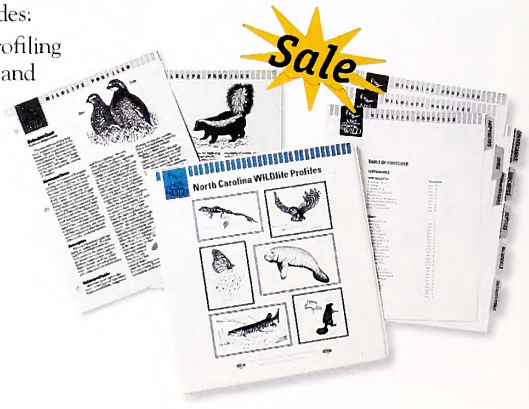
N.C. WILDLife Profiles Binder & N.C. WILDLife Profiles Sets 1–12 ▼

This top-quality 3-ring binder includes:

- 120 illustrated fact sheets, each profiling an animal's history, status, habitat and behavior, and also containing a range map. Half-price.
- Tab dividers that organize 12 sets of wildlife fact sheets by class.
- A table of contents, index and instruction sheet.

$15 ITEM CODE **W17**

Sale



Three for One

Your Dollar Can Reap Rewards for the Nongame and Endangered Wildlife Program

Did you know that your $1 contribution to the North Carolina Nongame and Endangered Wildlife Fund will actually provide $4 for wildlife conservation in North Carolina? Thanks to two new federal funding sources—the State Wildlife Grants (SWG) and the Wildlife Conservation and Restoration Program (WCRP)—your dollar can now be matched with three more federal dollars. Through these funding sources, the N.C. Wildlife Resources Commission already has received almost $3 million over two fiscal years to apply to a variety of wildlife monitoring, research, education and conservation initiatives.

WILDLIFE COMMISSION SPOTLIGHT

The key to continued federal funding is you—the sportsperson or wildlife enthusiast. The SWG and WCRP programs require a 25-percent match of state-generated money for a state to receive any federal funding. The commission relies upon the Nongame and Endangered Wildlife Fund to provide this 25-percent match. This fund is composed of citizens' donations generated through the N.C. Tax-Checkoff for Nongame and Endangered Wildlife, the Wildlife Commission license plate and direct donations to the fund.

Even though your donations have always been put to good use for the wildlife of our state, your buying power is now better than ever. Please consider contributing to the Nongame and Endangered Wildlife Fund today. For more information, visit www.teaming.com/site/index.cfm.

KEN TAYLOR

A wildlife biologist inspects a flying squirrel nest box. For more on flying squirrels, check out next month's issue.

KEN TAYLOR

North Carolina Projects Currently Benefiting from WCRP and SWG funds:

- Flying squirrel research
- Songbird monitoring on game lands and CURE areas
- Colonial nesting waterbird research, management and monitoring
- Stream restoration
- Habitat conservation
- Freshwater mussel and nongame fish monitoring
- Partners in Flight statewide bird-conservation program
- Citizen education

To contribute, please visit our website at www.ncwildlife.org, click on "Wildlife Species and Conservation," then "Nongame and Endangered Wildlife Program," or call (919) 733-7291 for details.

Cold Turkey

A majestic gobbler hunkers down on a frigid January day. Will a winter turkey season be approved for hunters? For more, see page 16.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

50% recycled,
30% post-consumer content

C93
7:67/2

WILDLIFE IN NORTH CAROLINA

FEBRUARY 2003 $1.50

Hobbies Within Hobbies

by Jim Dean

The fellow who repaired my kitchen stove this past winter was waiting for me to write a check when he spotted the 6-foot bow hanging on the wall in the den.

"I've been bow-hunting for over 20 years, and I've never seen anything like that," he said. "Would you mind if I took a look?"

I lifted the unstrung bow off the hooks and handed it to him. He caressed the smooth wood and carved horn tips. "It's an English longbow," I said. "It was one of two my father made in the 1930s, this one of lemonwood, the other of Osage orange." We went on talking, and I told him how Dad got interested in archery when he was a kid while reading Robin Hood. I conceded that longbows are no match for modern compound bows, but that they shoot surprisingly flat.

JIM DEAN

"Oh man, I'm in big trouble," my repairman said. "I'd love to make one. You suppose staves and other materials are still available?"

"I'm pretty sure they are," I replied. "Check the Internet."

His enthusiasm brought back memories of my childhood, when Dad and I shot targets with his bows. After I accidentally broke the Osage orange bow, he made a shorter one for me out of hickory. He taught me how to make all our accessories—Port Orford cedar arrows, flax bowstrings, and leather wrist guards, finger tabs and quivers. Later, when Fred Bear popularized compact recurved bows of laminated wood and glass, I bought one. Like the compound bows that followed, it was better suited for hunting in dense woods. But there was always something special about shooting those homemade bows.

Nowadays, hunters and anglers can buy everything they need ready-made. Nevertheless, the do-it-yourself ethic endures as a time-honored tradition, especially during the off-seasons. Our projects are limited only by imagination, time and skill. Like the mountain men who crafted their own kits, modern muzzle-loading buffs build their rifles, make powder horns and cut and lace their "possibles" bags. We reload ammo, grind the blades for hunting knives, carve decoys, build layout boats, hand-tool leather accessories, wrap rods, make lures and tie flies. It's sweet labor, and it keeps us in the game when we're not actually on the field.

"In truth, these hobbies within hobbies mainly keep the fever high. Nothing jacks up my desire to get back outside like tying a few bass poppers or repainting a half-dozen decoys."

When I was a young army officer, Pennsylvania's limestone trout streams beckoned less than an hour from my post. I could barely afford gasoline at 25 cents a gallon, much less decent tackle, but I found I could make everything I needed except my reel and fly line. My rod was built on a $4 Herter's blank, my wading shoes were old tennis shoes with carpet glued on the soles (no waders; I waded wet), and my flies were hand-tied. Mom made my simple vest—in plaid, alas.

Yet, anyone who thinks this is all about saving money is surely deluded. I might have thought I was being economical by tying flies to use in Idaho this past summer, but I conveniently overlooked the outrageous cost of 40 years worth of accumulated fly-tying materials. I also diverted my "profit" to a fancy fly reel I spotted in a local shop. And since my flies didn't catch fish, I wound up buying a bunch anyway.

In truth, these hobbies within hobbies mainly keep the fever high. Nothing jacks up my desire to get back outside like tying a few bass poppers or repainting a half-dozen decoys. And for those of us on the cusp of geezerhood, there's something else.

Last winter, I spent several days refurbishing the first surf-spinning rod I ever owned (Santa had originally ordered that Conolon rod and a Langley Spinator reel for $36 from Klein's in Chicago in 1952, when I was 12 years old). I removed the monofilament-grooved guides and heated the corroded ferrules until the cement melted and I could pull them loose. Then I lightly sanded the old glass stick and cork grips, mounted new ferrules and installed a set of guides, carefully whip-finishing each wrap. After the varnish dried, I took the rod outside. Held against the light, the blank was again the color of sourwood honey.

That old rod was not the only thing I had restored. For a brief moment, the clock spun backward: Suddenly I was sneaking out the front door again, and through the dunes at dawn with my new rod, having slept not a wink all night. I was young, lean and suntanned. In front of me, the emerald waves quivered in exquisite translucence before collapsing in foam. Just beyond them, I saw a bluefish jump.

Contents

WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

February 2003 *Volume 67, Number 2*

page 2

page 24

Features

2 **Acrobats of the Appalachians** *written by T. Edward Nickens*
In the high country of North Carolina, scientists ponder how tiny flying squirrels maintain the health of mile-high forests.

6 **Tempest in a Wooded Lot** *written by Brad Deen*
photographed by Jody Duggins
Backyard-browsing, traffic-daring deer are less of a wildlife problem than a human one.

12 **Just Add Water** *written by Gerald A. Almy*
It's every angler's dream—a private fishing hole stocked with big bluegills and fat bass.

18 **King of Ducks** *written and photographed by F. Eugene Hester*
Canvasbacks reign supreme along North Carolina's coastal sounds.

24 **Glass Lizard Tales** *written by Jeff Beane*
Often mistaken for snakes, and just as often the subject of folklore, glass lizards are reptiles with a knack for survival.

page 6

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Julie Dunlap* **28**
Back Porch *by Brad Deen* **32**
N.C. WILD Store **37**

Cover *Canvasbacks dive for aquatic vegetation in icy water. Photograph by F. Eugene Hester.*

page 28

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C. and additional mailing offices. Subscription rates: one year $7.50, three years $20, lifetime $100. All foreign subscriptions are $23.50 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377.

Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission. *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376. **Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.**

Acrobats of the Appalachians

written by T. Edward Nickens

In the high country of North Carolina, scientists ponder how tiny flying squirrels maintain the health of mile-high forests.

With one foot on an aluminum ladder and the other in the crook of a yellow birch tree, Chris McGrath has a million-dollar view. The flanks of Mount Hardy and Beartrap Knob fall away to a narrow cleft in the forest far below, the distant horizon etched by Fork Ridge, its crown sheathed in daggerlike red spruce. Snow lies deep in the woods of North Carolina's Southern Appalachians, bringing each saddle and gap into sharp relief.

But it's the view a foot from his face that McGrath finds more intriguing, for it's a sight few humans ever see: a Carolina northern flying squirrel. The diminutive squirrel, about half the size of its common gray cousin, peeks out of the darkened entrance cavity of a plywood nesting box, unsure about the intruder in its mountaintop home. Wispy strands of yellow birch bark, a favorite nest material, quiver with the squirrels' nervous movements. McGrath places a net over the hole and taps the side of the box. "They're really packed in there," he says with a chuckle, just as three squirrels bolt from the box, chattering their discontent to another pair left behind.

Carolina northern flying squirrels are among the most intriguing small mammals of the forest. Each is outfitted with a pair of wrist-to-ankle folds of skin called a "patagium," permitting long 45-degree glides of up to 150 feet. Altering tension on the patagia and steering with a flat, rudderlike tail, the squirrels are remarkably maneuverable in flight, able to steer around trees and branches before landing hind-feet-first. Approximately 43 species of flying squirrels exist worldwide, but only two live in North America, and both call North Carolina home. The southern flying squirrel is so common that its love of nesting in attics and chimneys makes it a nuisance. Not so *Glaucomys sabrinus*, the northern flying squirrel. Discovered along a huge swath of the continent from Alaska to Maine, and down the spines of the Rockies and Appalachians, the northern flying squirrel found fame and the scientific spotlight after biologists discovered that the endangered spotted owl of the Pacific Northwest preys primarily on the creatures. A spate of research was directed at flying squirrel populations in the vast timber stands of that region, which showed that flying squirrels are more prevalent in old-growth forests than in younger woodlands.

Meanwhile, its southernmost kin, *G.s. coloratus*, remained cloaked in mist and mystery. Found only in the high boreal forest of the Southern Appalachians, the Carolina northern flying squirrel is an endangered, rarely glimpsed creature. There are only nine known populations of Carolina northern flying squirrels, and those are scattered across some of the highest peaks in North Carolina, Tennessee and Virginia, where red spruce and northern hardwood forests form a relict of an ancient Pleistocene habitat type.

Such remote, restricted habitats have kept the Carolina northern flying squirrel cloaked in secrecy, but intriguing details are coming to light. In recent years, a few scientists have gone to extraordinary lengths to find out more about the species. In blizzards and bone-numbing cold, they hike through some of the most rugged territory in eastern America to monitor more than 950 man-made nest boxes erected in confirmed or potential flying squirrel habitat.

***A wildlife** biologist stands at the top of a ladder to check a northern flying squirrel nest box. Scientists must penetrate rugged terrain to study these elusive creatures.*

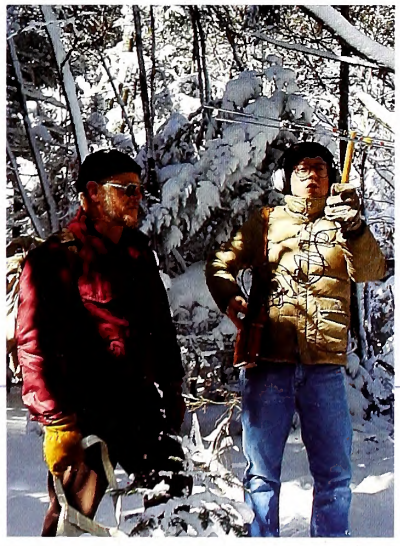
Biologists use a small cage *to hold a northern flying squirrel while it is banded, measured, then released. Tagging provides valuable information about these secretive creatures.*

KEN TAYLOR

Peter Weigl of Wake Forest University studies how the animals respond to disturbances such as roads. Susan Loeb, with the U.S. Forest Service, and others are examining how the flying squirrel's diet—largely underground fungi—might affect overall forest health. McGrath, an endangered-species biologist with the N. C. Wildlife Resources Commission, is field-testing a computer model designed to identify likely squirrel habitat by analyzing forest type, amount of dead wood on the ground, soil moisture and other variables. Collaborators with the Blue Ridge Parkway, National Park Service and North Carolina's state parks are searching for additional flying squirrel populations. One question concerns all of these researchers: How will these animals fare as the high-altitude coniferous forests of the Southern Appalachians succumb to the ravages of an exotic insect—the balsam woolly adelgid? Nearly half of the East's red spruce trees have already fallen to the Eurasian insect, leaving many high peaks mantled in dead and dying trunks.

To get to McGrath's study area in the Great Balsams of North Carolina, we've hiked from the snowbound Blue Ridge Parkway down the Mountains-to-the-Sea Trail, and into the 7,500-acre Middle Prong Wilderness of the Pisgah National Forest. All is quiet, and the snow is hatched with the tracks of grouse, bobcat, deer and a lone black bear. In dense copses of rhododendron, the evergreen leaves have curled around each leaf stem like old ladies wrapped in thin shawls. During the frigid winters, Carolina northern flying squirrels assemble in mixed-gender and mixed-age groups to spend much of the day holed up in natural cavities in standing dead birch and beech trees—or in boxes provided by researchers. Curled into tight balls, the squirrels can withstand drops in body temperature of more than 14 degrees Fahrenheit, which lowers their rate of heat loss.

KEN TAYLOR



Some scientists *use telemetry equipment to track the travel patterns of northern flying squirrels. Small radio devices are placed on flying squirrels so they can be quickly found next season to acquire additional data.*

It doesn't take long for their engines to warm up, though. In seconds, they go from snoozing in the nest box to squirming in McGrath's net, like fish just scooped from the water. Off to one side of the Mountains-to-the-Sea Trail, McGrath's assistant, John Cecil, spreads a backcountry laboratory over the snowpack: scales, ear tags, banding pliers, calipers and data sheets. McGrath adds three cloth bags bulging with squirrels. With heavily gloved hands, he gently positions each squirrel as Cecil clips a tiny metal band to the right ear, then gingerly measures a hind foot. To release the squirrels, McGrath holds them one at a time next to a stout tree branch for a quick escape skyward. Instead, each squirrel launches into the air from his gloved hand, gliding like a miniature kite to the ground, then skittering into the dense rhododendrons.

So far, McGrath and his colleagues have identified a number of markers that indicate prime flying squirrel habitat. Most frequently, they find the animals in the transition area between red spruce stands and northern hardwood forests of yellow birch, American beech and red and sugar maple. They've caught far fewer squirrels in red oak forests, the other major forest type in this region. There seems to be something about the mosaic of northern hardwoods and towering spruce trees that attracts Carolina northern flying squirrels like pigs to truffles.

In fact, the attraction may very well be truffles, although not the variety that sends gastronomes into a swoon. Unlike their acorn-loving, diurnal kin, Carolina northern flying squirrels are strictly nocturnal, foraging on the ground for lichens, catkins, insects, fruits and, in the spring, the staminate cones of conifers. But above all else they prefer the fruiting bodies of hypogenous (underground) fungi—truffles, as it were. These long, thin strands of matter grow on tree roots and serve as root extensions, collecting water and nutrients that they share with their hosts in a mutually beneficial relationship. Because they exist underground, hypogenous fungi rely on digging creatures such as flying squirrels to spread their spores. That leads to an intriguing

aspect of flying squirrel ecology: the potential link between old-growth forests and flying squirrel populations. Old-growth forests are characterized by large live trees and rotting downed trees, which foster the growth of the lichens and fungi so prized by the northern gliders.

In the southern highlands, truffles are far more abundant in red spruce groves than in hardwoods. It could be, Loeb says, that flying squirrels are a major dispersal vector for the beneficial truffles, which are carried in their stomachs to be deposited elsewhere in the animals' scats. "If the spruce are dependent on the hypogenous fungi for growth and reproductive success," Loeb explains, "then the squirrels may play a very important role in maintaining forest composition by distributing the spores over the landscape."

Loeb is busy analyzing squirrel scat to determine how much of the animal's diet consists of fungi. For the moment, however, it's the maintenance of the Carolina northern flying squirrel that has scientists pulling out the stops in the Southern Appalachian high country. Just as researchers are piecing together a portrait of the secretive, winged mammal, more and more threats appear.

There are no known means of halting widespread tree mortality from the balsam woolly adelgid. Road construction in the tourist-heavy mountains is fragmenting squirrel habitat. Weigl found, for example, that large road projects, such as the contentious 52-mile Cherohala Skyway across North Carolina's Unicoi Mountains, are barriers to Carolina northern flying squirrels. Such roads are too wide for the squirrels to glide across, and patrolling bobcats, foxes and coyotes kill squirrels daring enough to dash across the blacktop.

But research is time-consuming. McGrath watches squirrel after squirrel leap from his hands into the dense Southern Appalachian forest cover. Not a single one gives us more than a few seconds to observe it. It seems to be a characteristic of the species. "These animals are very difficult to catch and study," McGrath notes wryly. "And it seems the more we study them, the more questions we come up with."

The good news is that scientists know where to find the pieces of the puzzle: They are snuggled down in a chain of nest boxes strung a thousand strong across the highest ramparts of the Southern Appalachian mountains. And one by one, they'll be roused awake with a knock and a net. ⊠

KEN TAYLOR

Return the Gift

Wildlife is a gift often taken for granted. Please return it. The Nongame and Endangered Wildlife Program is dedicated to conserving the native wildlife of North Carolina. Lend your support to this effort through a tax-deductible contribution on your North Carolina income tax form, or send your contribution today to Nongame and Endangered Species, N.C. Wildlife Resources Commission, 1724 Mail Service Center, Raleigh, NC 27699-1724.

NORTH CAROLINA NONGAME & ENDANGERED WILDLIFE FUND

TEMPEST IN A WOODED LOT

WRITTEN BY BRAD DEEN
PHOTOGRAPHED BY JODY DUGGINS

A DEER HEAD, ANTLERLESS, POKES OUT OF THE THICK HEMLOCK forest. Its black nose sniffs and twitches—once, twice—before the doe trots onto the sloping green lawn. The deer seems unconcerned, unalert. Its tail droops. In the open like this, even a young whitetail should cock its tail upward, exposing its namesake flash of white flank at the first sign of us humans. Something unnatural is at work in this manicured, fairwaylike backyard.

"The deer are one of the reasons we moved here," says the Biltmore Forest homeowner, who prefers to be anonymous. "They'll almost let you pet them." From the back porch, we watch the doe amble amid the bordered pansy beds and blue spruces. It stops at a birdbath filled with shelled corn.

"That one's name is Ariel," the resident says. The name comes from the woodland sprite in Shakespeare's play "The Tempest." It's fitting.

A storm has brewed for 15 years in this wealthy enclave beside Asheville. At the tempest's center are deer. Swirling around them are the antagonistic forces of deer-baiters and deer-haters.

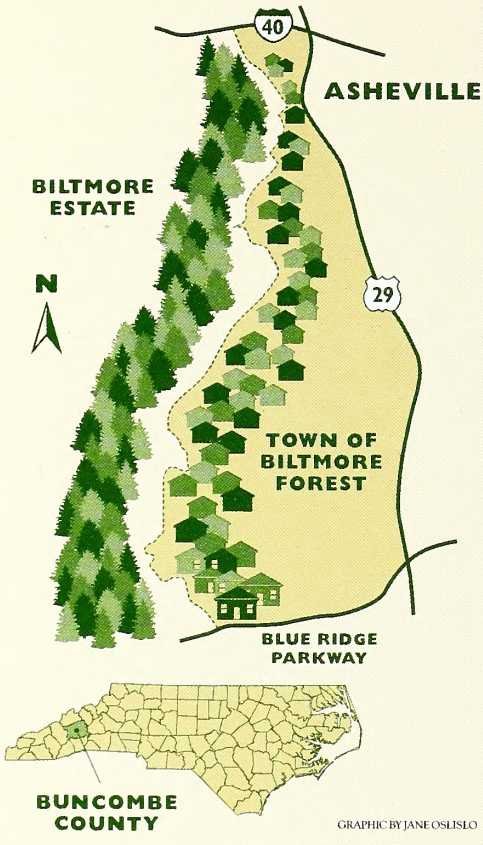
A few doors down from where Ariel and other deer are welcome to frolic, another Biltmore Forest resident curses them as "big, furry locusts." Like his near neighbors, this resident speaks openly only when assured of anonymity. He says he fears reprisals from "some of the hardcore animal-rights people." (The other side offers similar rhetoric about its opposition.) In his yard alone, he says, the deer have eaten upwards of $50,000 worth of landscaping—roses, azaleas, rhododendron, even hemlock, maple and bay greenery as high as they can reach, which is considerable. "I've even seen them stand on their hind legs to eat the leaves. Not propping themselves against the trunk with their front legs, but just standing right there, under the limbs," he says. "I had no idea they could do that. It's surreal when you see them do that, like—what is that cartoon?—'The Far Side.'"

BACKYARD-BROWSING, TRAFFIC-DARING DEER ARE LESS OF A WILDLIFE PROBLEM THAN A HUMAN ONE.

The deer are a menace, he says, and not just because they prevent the wooded lots of Biltmore Forest from fully complementing the million-dollar houses. The deer bound across the narrow, winding streets, occasionally colliding with a Mercedes or Lexus. The town reported 49 deer-vehicle crashes in the past two years. And fears of disease—first Lyme and now chronic wasting disease, which has not even been reported in North Carolina—have many residents wary.

Countless times over the past decade-plus, experts from the North Carolina Wildlife Resources Commission, state Cooperative Extension Service and even private industry have spelled out to the town what it needs to do to manage the deer: Hunt some, and fence out the rest. But the town, like other deer-bedeviled communities across the nation and the state, has had to battle itself before it could take on the deer. And the Bambi Brigades have proven as intractable as the Landscape Legions.

"It's not so much a deer problem as a people problem," said Wildlife Commission deer biologist Evin Stanford.



GRAPHIC BY JANE OSLISLO

POLITICAL PARALYSIS Biltmore Forest lies sandwiched between Asheville and the sprawling Biltmore Estate. Founded in 1923, Biltmore Forest was meant to be, and still is, a designed community where covenants and zoning are extremely restrictive. At the center of town is the country club and golf course, founded to provide seasonal recreation for wealthy Northeasterners, who could boast of being neighbors to the Vanderbilt family's famous country house, the Biltmore Estate. The town, in fact, was carved from the eastern side of the Biltmore Estate, which at 11,000 acres still dwarfs the town in area nearly 8 to 1.

Just a few of the properties now are seasonally inhabited, said Town Administrator Nelson Smith. The year-round citizenry includes much of Asheville's professional elite and retirees from across the world. And deer—plenty of deer.

Much of what makes the real estate attractive also attracts deer. The quiet forestland is punctuated by wooded yards; residents can enjoy the solitude yet retain sociability. The deer can browse in the open and dash to shelter. And proximity to the Biltmore Estate provides a lush backyard for many, although the private estate is also home to many deer that wander back and forth. Most of the backyard browsing occurs in late summer and winter, when natural food sources become scarce.

In the late '90s, the Biltmore Estate offered to help barricade the town from the deer. The estate would donate a right-of-way along the town's western perimeter for a fence, which the estate also offered to maintain. All the town had to do was build it. They balked.

Smith, the town administrator, says the fence would have had to be at least 12 feet high. "And even that wouldn't be tall enough. Some of those deer can really jump," he said. He added that "some property owners made it known they didn't want to see a fence along their property."

Covenants dating to the town's inception have been unfriendly to fences. "Historically," said Mayor Ramona Rowe, "Biltmore Forest has shied away from fences because we wanted to maintain the philosophy of openness, of spaciousness—a natural environment without artificial boundaries."

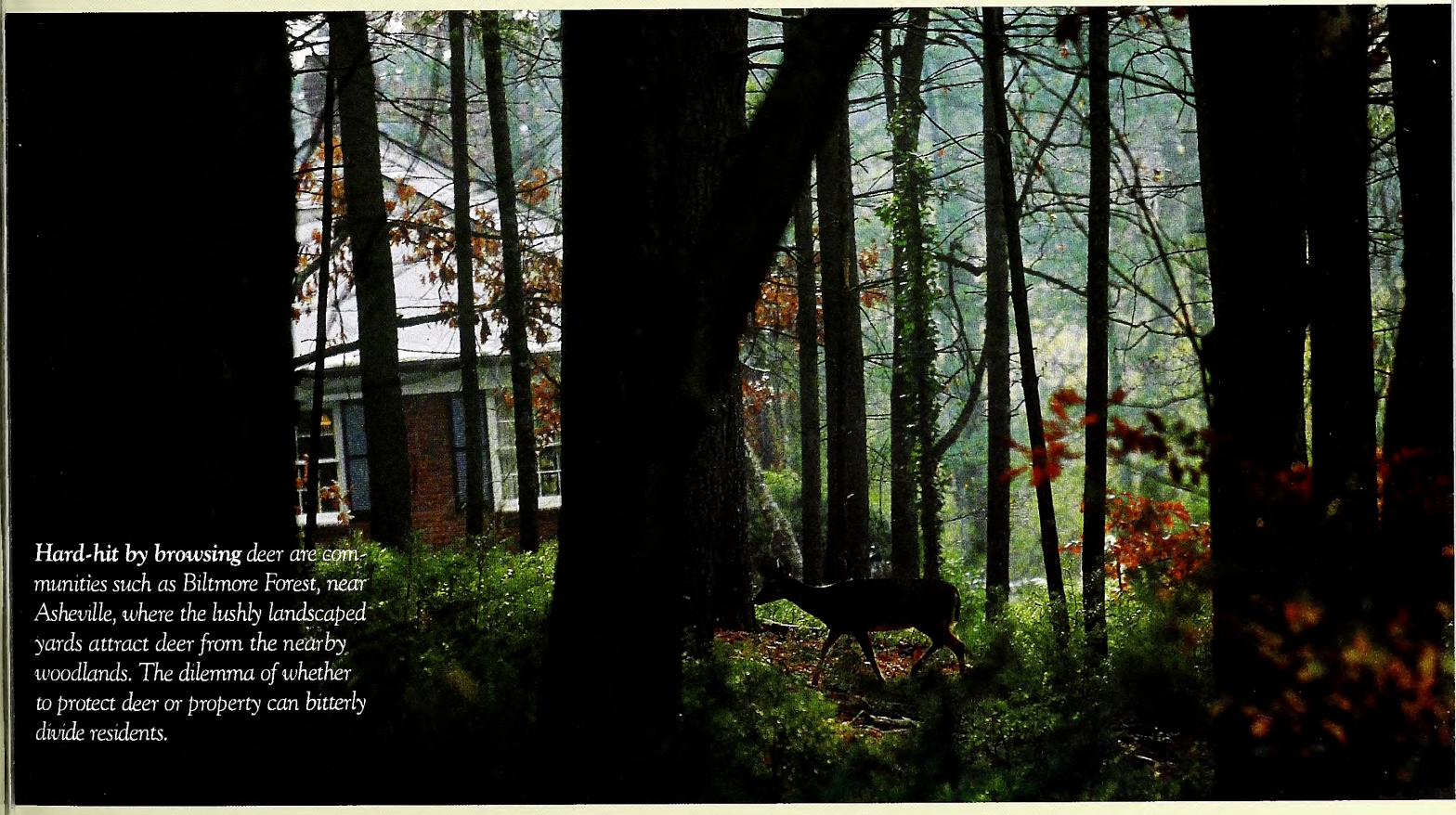
A few property owners have defied the anti-fence ordinance. With that in mind, the town's Board of Commissioners has considered relaxing the prohibition. "Of course, some people say 'over my dead body,'" Rowe said. "If we have people putting up illegal fences, we're making them outlaws.

"It's not just that people here want to plant a few petunias," she added. "We have people here who are nationally recognized horticulturists. It's their passion, and between the deer and not being able to exclude them, they can't pursue it. I told some of our big golfers, if somebody told you [that] you couldn't golf, you'd move. It's the same thing. Not allowing them to put up a fence is taking away their gardening."

Consensus on any deer-related issue has been difficult to find, the affable, Boston-born mayor admitted. Yet a vast middle ground seems to exist. A town-sponsored survey last summer found 78 percent of households agreeing that the deer were "a problem," and 68 percent favored a deer-management plan that would include hunting.

The problem is one of extremism. In 2000, for instance, the town leadership thought it had everything lined up to hold an archery hunt during the regular fall season. A town resident who opposed hunting successfully sued, getting an injunction against the hunt. The legal grounds were that the town did not have the necessary legislative authority to regulate wildlife, which only the Wildlife Commission possesses. The planned hunt, however, was one of the commission's recommendations. The town did not appeal because of "financial constraints," said Smith, the town administrator.

BILL LEA



Hard-hit by browsing *deer are communities such as Biltmore Forest, near Asheville, where the lushly landscaped yards attract deer from the nearby woodlands. The dilemma of whether to protect deer or property can bitterly divide residents.*

DEER DILEMMAS Human-deer conflict isn't confined to Biltmore Forest, obviously. The recovery of the whitetail is a nationwide phenomenon. Numbering just a half-million in 1900, they now surpass 20 million, probably as many as were alive in 1800. But the United States has more than 20 times the population now as it did two centuries ago.

***Not just flowers** and shrubs are the victims of uncontrolled deer. Highway collisions are increasing, and the entire ecosystem can be damaged when deer gobble up the forest understory.*

Changing development and transportation patterns have also made clashes between the two species inevitable, with more at stake than landscaping. According to federal transportation figures, more than 100 Americans die annually in deer-vehicle collisions.

Here in North Carolina, according to the state Department of Transportation, the number of reported vehicle collisions with animals (almost all of which are deer) has accelerated by 43 percent, from under 11,000 in 1996 to more than 15,500 in 2001. The rise isn't attributable to more deer; the state's herd has remained steady at 1.1 million since 1993. And the human population of North Carolina grew by 9.3 percent from 1996 to 2001, according to the Office of State Planning. What have increased are registered vehicles (up 8.5 percent since 1996, according to the N.C. DOT) and vehicle-miles traveled (up 16.5 percent over the same period, from 78.6 billion in 1996 to 91.6 billion in 2001).

Combine those transportation figures with the millions of acres lost to development, and a portrait of sprawl-friendly development emerges—large-lot subdivisions that require a lot more driving to reach jobs and stores. And considering that these new houses generally displace woods and fields, it is plain where the deer are coming from.

"It is becoming more of a problem as more areas of the state develop," said Mike Carraway, a technical guidance biologist with the Wildlife Commission. "People move in, close hunting season and plant things deer browse on."

Carraway has worked with officials of Biltmore Forest and other mountain communities for more than 10 years, suggesting the same measures over and over again. "What it comes down to is this: There are very few people who don't want hunting," he said. "But culling is the best, most reliable tool we have to manage the deer population."

Other methods that hunting opponents have proposed are either inefficient, useless or loaded with unintended consequences. Trapping and relocating deer, for example, requires lots of money and time; yet as soon as a few deer are taken away, "the vacuum just sucks more deer into the area," Carraway said. And that's not even considering the recent Wildlife Commission ban on transporting deer and elk as a precaution against chronic wasting disease, which has hit Midwestern states hard but, so far, has not turned up in North Carolina deer.

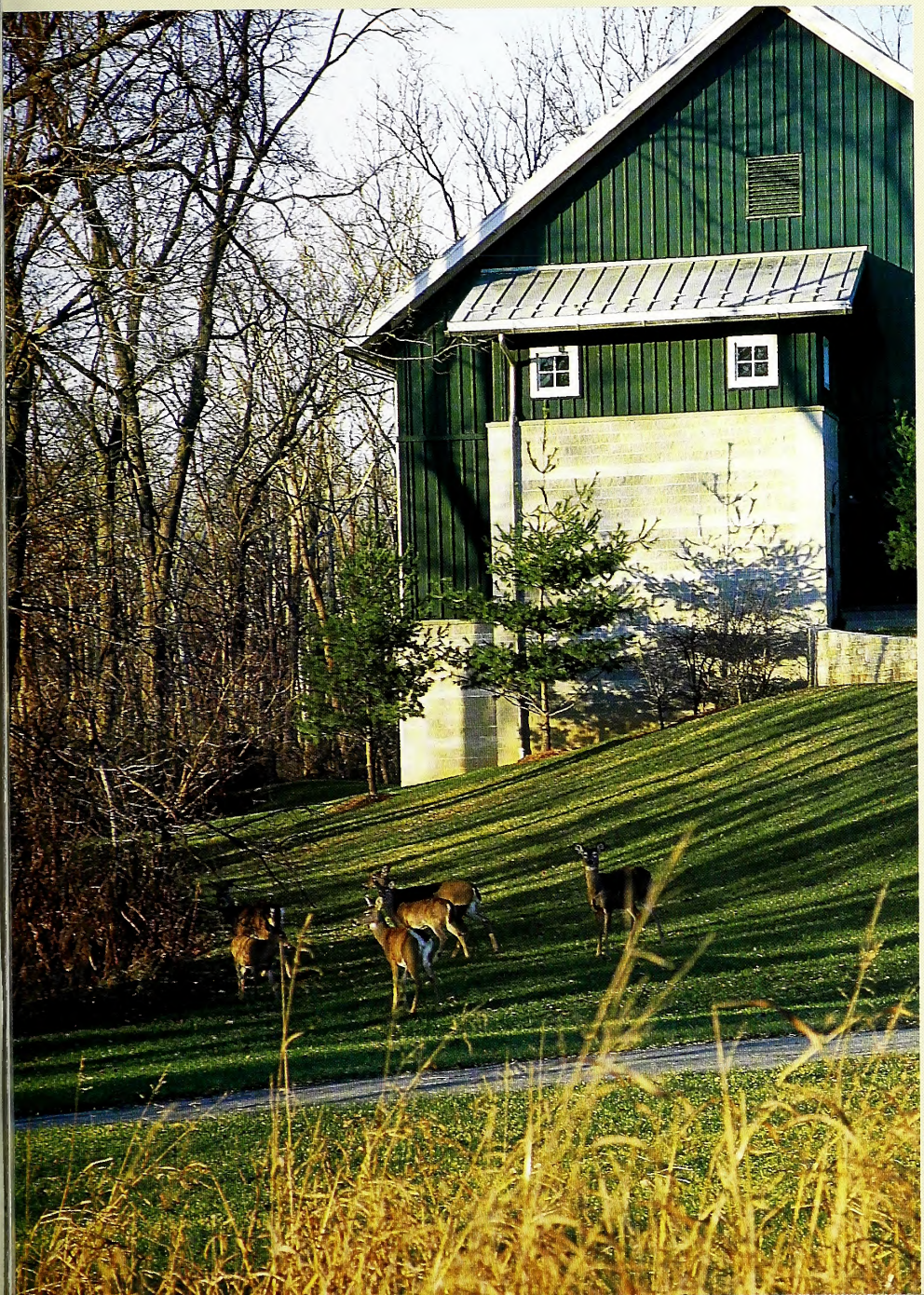
Birth control is not yet a feasible option. The problem is that the technology is only in the initial stages. Wildlife researcher Allen Rutberg of Boston's Tufts University has successfully thinned herds of both deer and wild horses using contraceptive-laced darts. But for now, the technique works best on enclosed populations, such as on islands, rather than free-range animals. "We're a long way from managing the entire deer population of, say, a 10-square-mile township with immunocontraception," Rutberg said.

A former top scientist for the Humane Society, Rutberg also counsels people to be more patient with nuisance deer—who are, after all, only behaving like deer. "We're displacing them. People should get used to having deer around," he said.

BILL LEA

NIP IN THE BUD Other communities in North Carolina are grappling with the same dilemmas as Biltmore Forest. The squeakiest wheels—the ones getting the most media coverage as they demand solutions—are, like Biltmore Forest, exclusive addresses. Chapel Hill's Fearrington Village has struggled to find an answer to the hunt-them/protect-them demands of divided homeowners. And on Bald Head Island, where deer were scarce until Corncake Inlet filled in a few years ago, the expanding herd threatens to ravage the rare and protected maritime forest.

F. EUGENE HESTER



Biltmore Forest's mayor Rowe has a beach house on Bald Head Island, giving her two perspectives on the dilemma. "They have an opportunity to nip it in the bud on Bald Head," she said.

Biltmore Forest tried to nip its problem through an avenue new to North Carolina—employing a Connecticut-based firm called White Buffalo, which specializes in eradicating nuisance deer. The company proposed using several techniques, from sharpshooters hunting over bait with silenced rifles, to trapping deer and killing them with the bolts used in slaughterhouses. But the Wildlife Commission chose not to allow the necessary permits.

"We'd really prefer that they try other, more conventional methods first," said Richard Hamilton, chief deputy director of the Wildlife Commission. "Look at Landfall [a gated community near Wilmington]. Every year in season, they have an archery hunt that controls the deer population. It's behind the scenes; it's quiet. Many folks there think it's a great thing."

After much wrangling, the town received its long-sought depredation permit from the commission last August, allowing the town to take up to 150 deer, preferably with bowhunters. The permit expires March 31, but as of mid-November, town officials said no deer had yet been taken.

The deer tempests continue to rage across North Carolina—indeed, across the nation. And as these local dramas play out endlessly—plant lovers refusing to compromise with nature, and deer lovers refusing to consider that some species have evolved to be prey—they begin to resemble another Shakespeare play, "Romeo and Juliet." In this one, feuding neighbors refuse to put aside their differences, spawning a tragedy not just for themselves, but for citizens caught in the middle. Will the Bambis and the Landscapers put aside their differences, or will they bring a plague on both their houses? ⊠

***Hunting, fencing** and inedible landscaping are the methods most favored by wildlife biologists to control deer herds. But to a certain extent, property owners along the edge of forests may just have to get used to the creatures.*

F. EUGENE HESTER

Just Add Water

written by Gerald A. Almy

It's every angler's dream—a private fishing hole stocked with big bluegills and fat bass.

Building your own private fishing lake is a fantasy most anglers have had at one time or another. No competition, no crowded boat ramps, no launch fees or tournaments. You manage the water as you please, releasing most of the bass so they can grow fat and sassy. A private pond means bluegills can be fried fresh at night from a pond just down the hill, and forget about those long drives to distant lakes.

The list of fishing benefits is a long one. But a pond has lots of other pluses as well. It immediately increases the value of the property, whether it's a few acres in the country or a large farm. The increase in value is usually many times more than the cost of the pond's construction. Ponds also enhance the aesthetics of a piece of land, adding a watery relief to an otherwise terrestrial setting. Finally, the wildlife benefits of ponds can be incredible. Ducks and geese are the most obvious beneficiaries, but deer, turkeys, quail, doves, songbirds and squirrels also use ponds.

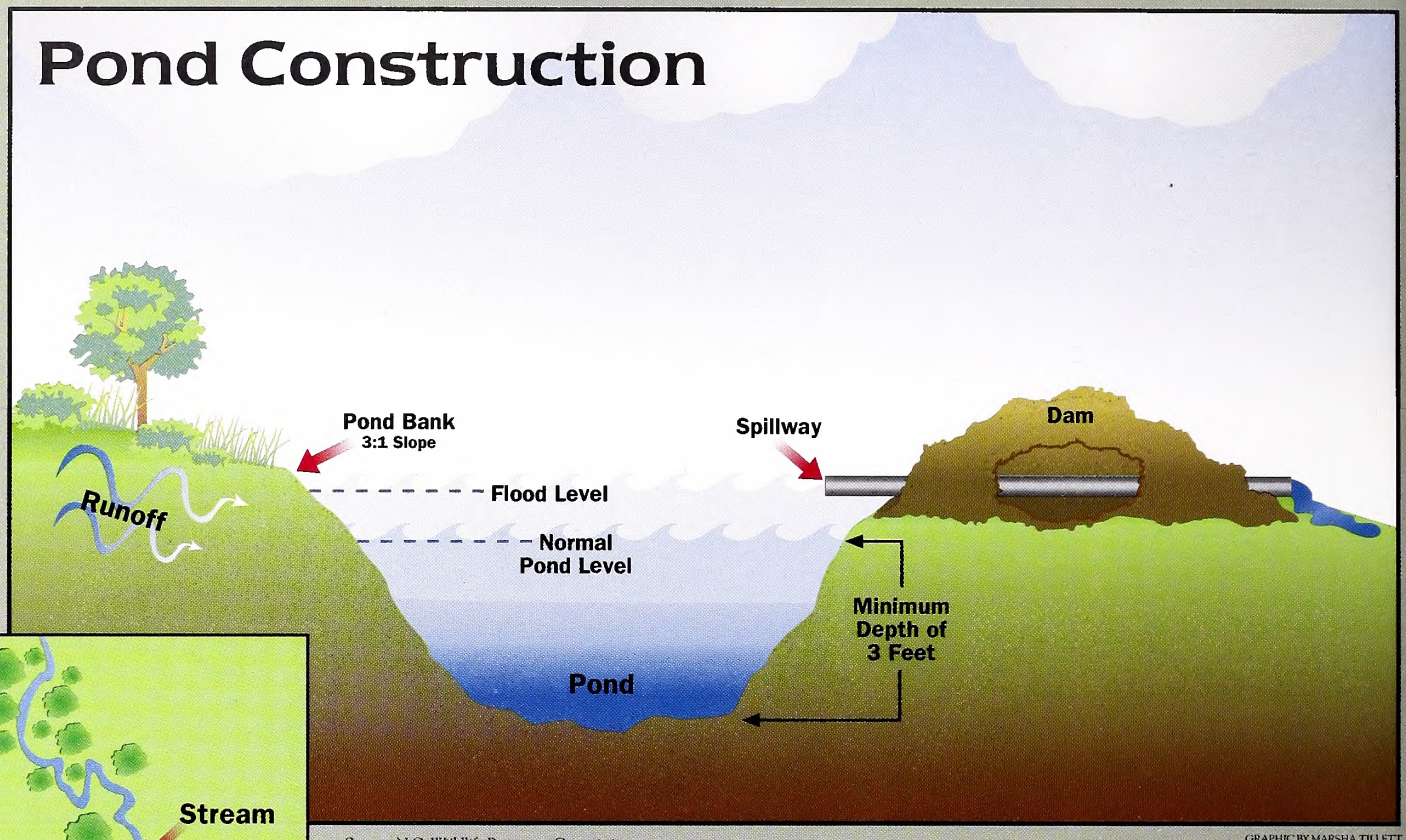
All of these reasons have figured into my decisions to build ponds over the years. So far I have three ponds, and a fourth is in the planning stages. I built them mainly for fishing and wildlife viewing, and these benefits have developed beyond my greatest expectations. At present, our ponds have a healthy population of bass, some of which have reached 6 pounds. A large number of good-sized bluegills are willing to take flies or lures virtually anytime from spring through fall. And through a stroke of luck, our property has a strong spring that stays cold enough to hold trout year-round.

The wildlife benefits have been equally impressive. Our family often sees deer, doves and squirrels at the ponds. And because we built two of them with small islands, we get to watch two pairs of Canada geese return each spring and raise their young. The larger pond usually supports a breeding pair of mallards that raises a family. Its island also has a willow tree with a hole in it that wood ducks use, raising five to nine young each year. Seeing the protective parents raise their little, yellow bundles of fluff into mature geese and ducks is so enriching that I would have paid for the ponds just for that benefit alone. In the fall, the ponds attract other waterfowl that can be hunted, adding another benefit.

How to Start

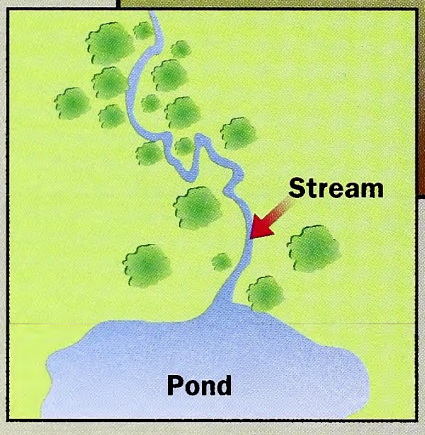
As with most undertakings in life, one must begin by looking at finances. A pond can cost anywhere from $500 to $15,000, depending on its size and the land's topography. Planning, heavy equipment and numerous other costs can factor in. But as a general rule, figure around $1,500 to $7,000 for a pond of a half-acre to 4 acres —a good size for most landowners just getting started in pond building.

Pond Construction



Source: N.C. Wildlife Resources Commission

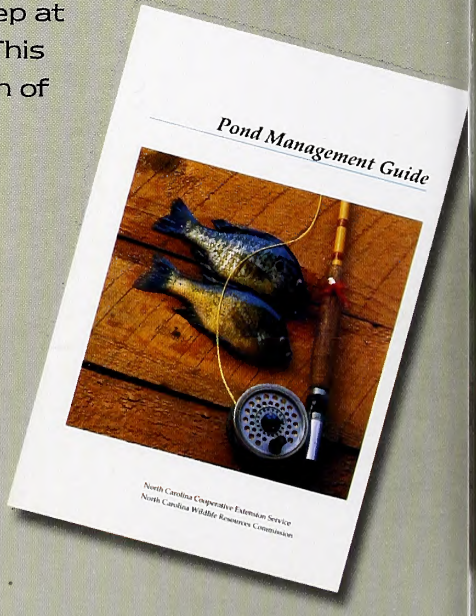
GRAPHIC BY MARSHA TILLETT



The average depth of a pond should be between 6 and 8 feet with a minimum depth of 3 feet. If the pond is built on a slope or is a dammed stream, the spillway should be at the lower end to prevent the water from rising to a level that threatens the earthen dam.

The bank of the pond should be built on a 3-to-1 slope, meaning 3 feet of rise for every 1 foot of run and should be a minimum of 3 feet deep at the waterline before leveling off. This shape will help prevent the growth of nuisance aquatic vegetation and discourage muskrats.

F. EUGENE HESTER



To receive a free "Pond Management Guide" booklet from the N.C. Wildlife Resources Commission, call (919) 733-3633, or e-mail allenhl@mail.wildlife.state.nc.us.

GERALD A. ALMY

GERALD A. ALMY

GERALD A. ALMY

Your local fisheries biologist can offer specific advice about the feasibility of a pond on your property: where it should be located, what size it should be and how it should drain. You can hire a private engineering company to design plans for your pond and hire subcontractors to build it. In some cases, you might be able to deal with the pond builder directly.

One of the most important decisions in building a pond is where it will be located. Topography must be considered first. The ideal spot is where the land dips toward a natural site, perhaps with several sidehills looping down into a low area. A flat area in a small valley is good, or a low spot that's fed by springs. You can simply build a pond on a flat piece of pasture, but having enough water to fill it and keep it full is often a problem on such a site.

It is good to find a site where several slopes drain or where a stream forms after rains. You can even dam up a small all-weather creek, but be sure you find out how much water comes down after heavy rains. It may be too much, and it could flood your pond. In this case, you can build the pond off to one side of the stream and have a channel leading to it from the stream, with a gate to control the pond depth. Large drainpipes may be required if you build a pond directly on a stream that collects quantities of runoff and rises heavily after rains.

On a pond that simply takes the drainage from a few sidehills, a drainpipe of 6 to 12 inches in diameter will likely suffice. For a pond that drains a larger area, 18- to 36-inch pipes may be required. Another option is installing gates or valves in the drain system so that you can manipulate your pond level. As a last result, you can always rent a water pump.

With some small ponds that drain a very limited area, you can actually get by with just a spillway—a low point somewhere along the pond where water channels and overflows when the pond reaches capacity. My smallest pond is of this type; and for the area that it drains, this system works well. My largest pond, on the other hand, collects water from a much

Heavy equipment (top) *is used to dig out the bowl of a pond. Before filling the pond, a drainpipe is installed (middle) to manage the water level. The final step involves stabilizing the pond banks with grasses and woody vegetation.*

larger area and requires a large drainpipe. Even in ponds with drainpipes, a spillway is needed as a backup for controlled release of extra water when the drainpipe is filled to capacity or gets clogged up. Sometimes, in ponds draining big areas, two spillways are best. You don't want water to flow over these areas more than a few inches deep, though, or fish may escape. Also, don't put a grate or screen across the spillway—it might clog up with debris.

How large a pond should be is a function of three things: the lie of the land, the abundance of the water source and how big your bank account is. In some folds in sidehills or bottoms between two swales, a third- or half-acre pond may be all you can build. In open bottomland that drains a large area, you can probably build a pond as large as you can afford.

How deep to build the pond also depends on the topography and your purposes. For most warm-water ponds, a minimum depth of 6 feet at the deepest spot is crucial to retain sufficient oxygen for aquatic life during winter and summer months. If possible, try for 8 to 12 feet at the deep end, in front of the dam, when the pond is full.

Avoid having the pond taper to very shallow water at the upper end. If possible, that end should be 3 feet deep or at least 2. Less depth tends to increase the likelihood of weed problems. Furthermore, it's imperative that all topsoil be removed and a hard, impervious bottom of packed clay be formed for the pond to hold water securely.

If the bottom is sandy or rocky, a pond may not hold water well, so it's important to check ahead of time with a soil expert or the district office of the N.C. Division of Soil and Water Conservation. Avoid sandy soils, rock, shale and limestone areas. Ideally, you want to find clay beneath the topsoil that can be packed down to form an impervious bottom. This material swells when it's compacted and then becomes wet, helping to seal any potential leaks. If the bottom doesn't appear to hold water well, you may have to haul in truckloads of bentonite—a volcanic material—to seal the bottom of the pond so that it will hold water. In small ponds, plastic sheeting can sometimes be used to line the bottom. Fortunately these steps are rarely required. Even if a pond leaks slightly during the first year, it will often seal itself as silt washes in and stops the leaks.

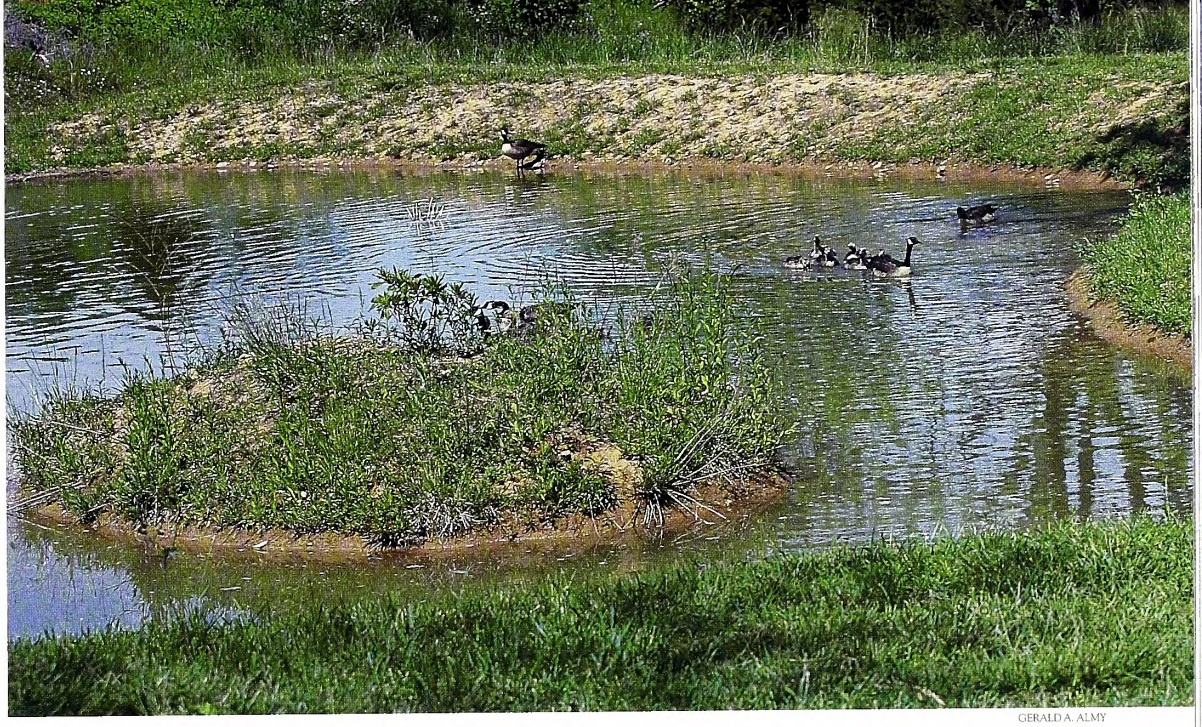
Sometimes it's feasible to leave some standing timber and brush in a pond to provide fish cover, but usually it's best to clear the pond completely so that the bottom can be firmly packed and sealed with clay. Then you can add structure, either before the pond fills, staking it to the bottom, or after, by dropping in trees, wooden crates or brush wired to rocks or cinder blocks. Another step worth considering is adding a truckload of small-sized gravel, spread out in a shallow cove or near the shore, where it's not likely to get silted over. This will make prime spawning habitat for bluegills and redears.

More often than not, the best fish to stock in your pond will be warm-water species—largemouth bass, bluegills, shellcrackers and catfish. If weeds start to become a problem, you can add grass carp to that list. These fish will keep vegetation under control but do not reproduce, so they won't overrun the pond. Crappies should generally be avoided unless you have a fairly large pond and can fish for them regularly and keep their numbers in check. In most ponds, crappies will multiply too fast and become stunted, throwing the population out of balance. Generally, a rate of around 75 to 100 bass per acre and 350 to 400 bluegills is about right.

The rewards of *building your own pond include a private fishing hole and a place to watch wildlife gather.*

GERALD A. ALMY

KEN TAYLOR



GERALD A. ALMY

You may want to buy small numbers of fish to stock a few at a time, so you can examine the fish in the clear bags and make sure they are the species you ordered. A second option is stocking the pond through angling. Catch the adult fish you want from a nearby pond or lake and put them in coolers, live wells or aerated tanks until you're ready to move them. This is legal for bass and sunfish, but remember that daily size and creel limits apply.

If you put in fingerling bass, it will be several years before they attain much size. The same applies to bluegills and redears. Put in adults, and they'll provide quality fishing more quickly. They'll also spawn soon, stocking the pond either the year you put them in or the next.

Stocking minnows is not a bad idea, either. You can buy fathead minnows or similar species from hatcheries, and chances are good that they will reproduce. Young bluegills provide a good food source for bass, but having minnows present is a plus for any pond and results in fatter, more abundant gamefish. Frogs and tadpoles will usually get into a pond naturally, but add them if they don't appear on their own.

Fertilizing the pond is an option if it seems excessively clear and gamefish do not seem to be growing well. Fertilizer should be considered if the water is so clear that you can see deeper than 18 inches. Fertilizer increases plankton and zooplankton, which leads to an abundance of minnows, crustaceans and insects. Those in turn create food for gamefish. You can add lime to a pond, either before it fills or afterward, if the pH is too low.

What to plant around the pond is an important detail. Fescue certainly provides good erosion control. A better bet for wildlife, however, are seeds such as clover, orchard grass, switchgrass, bluestem, rye and lespedeza.

Islands

Leaving an island in a pond is something far more pond owners should consider. Usually a section can simply be left in the upper end of the pond to form the island. This adds aesthetic appeal and fish structure. And it is often the key to having Canada geese and, sometimes, wild mallards or wood ducks successfully nest on the pond. The island provides a sanctuary where they can be safe from foxes, opossums, raccoons, dogs and other nest marauders.

Islands don't have to be large. Our two allow geese, mallards and wood ducks to raise young each spring, yet one measures 20 by 25 feet. The other one, on a smaller pond, is only about 6 by 8 feet, yet it's big enough for geese to nest on successfully every year.

Permits

Gone are the days when you could just go out with a bulldozer and dig a pond where and when you wanted to. The Natural Resources Conservation Service of the U.S. Department of Agriculture has standards and specifications for construction of farm ponds. Construction of a pond could involve a Dam Safety Law permit or an erosion control plan from the Division of Land Resources. Construction in a stream may require a permit from the U.S. Army Corps of Engineers and a certification from the Division of Water Quality. There could also be local Health Department requirements.

Pond Problems

One of the most common problems that can develop with a pond is an unbalanced fish population. You may like to release everything, but it's important that some panfish be harvested, and also some bass, to avoid overpopulation and stunted fish. Avoid taking too many large fish, though. Take out just a few bass in the 8- to 11-inch class and plenty of bluegills—20 or 30 for every bass you harvest. This goes against traditional wisdom, which says you should wait until bass get to be at least 14 inches long before harvesting them. The reason not to harvest these larger bass is that they are the most effective predators and can keep bluegill numbers in check. Furthermore, they are the most fun to catch, so why kill those 2- to 5-pounders? With the right conditions, you might wind up with a few 7- to 9-pounders in your pond. Be sure to use barbless or at least single-hook lures, though, if you plan to release the bass. They cause fewer injuries.

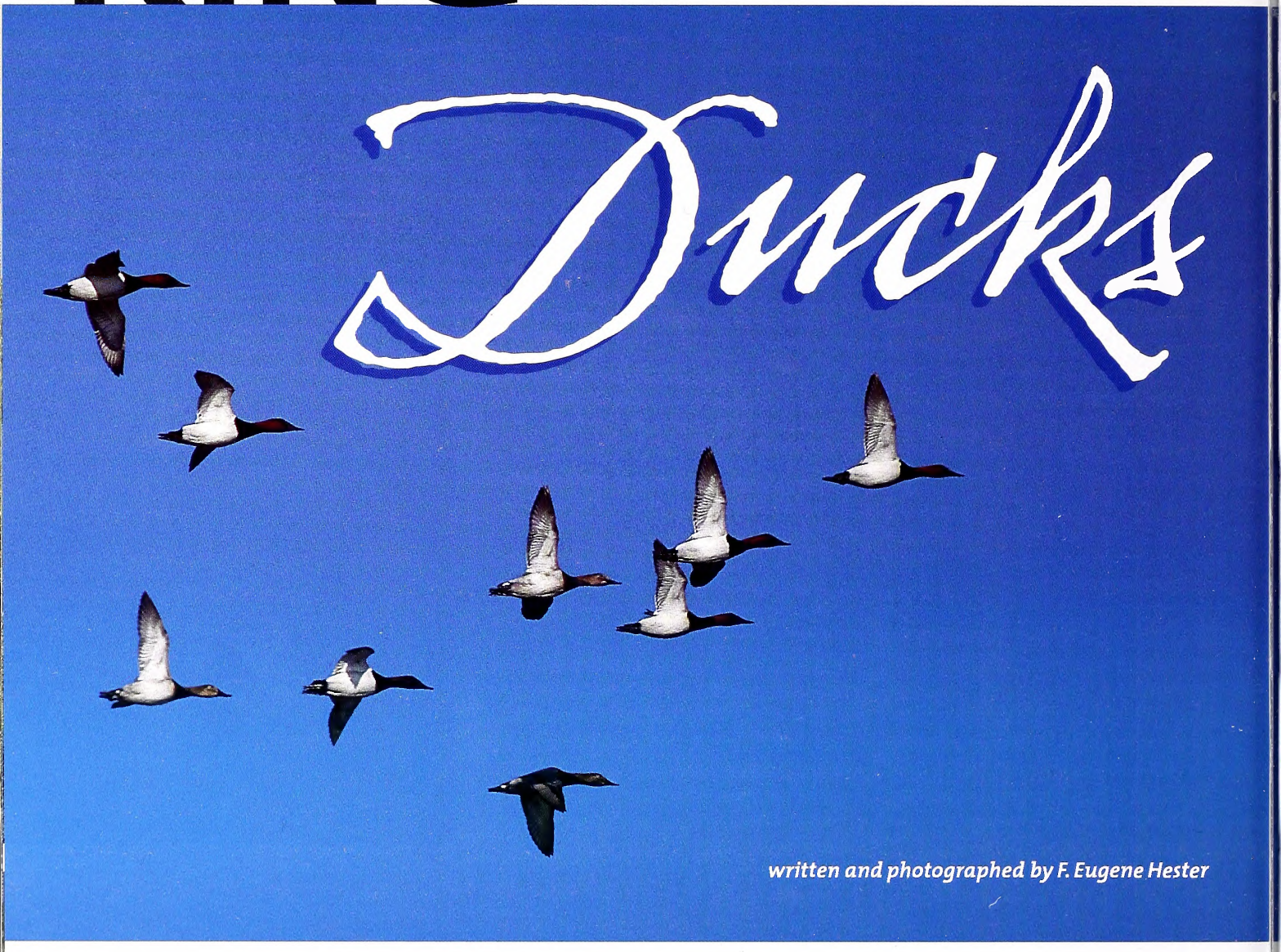
If you don't want to keep fish for yourself, chances are the neighbors would like the opportunity to either catch and keep a few themselves or eat a few that you catch for them.

Another problem is muskrats, which can burrow holes in a pond's edge, creating dangerous soft spots and holes where people or livestock can fall and injure themselves. They can also burrow into your dam and create holes that will undermine its soundness. Have a trapper come in if you have a problem with these mammals, or shoot them when legal. Beavers can cut down trees and sometimes cause serious damage to pond dams, as well. Consult with a biologist if you're unlucky enough to have these critters invade your pond. Keeping the grass or other vegetation around the edges mowed close to the ground will discourage muskrats.

A certain number of weeds can be good for a pond, particularly bottom-rooted varieties. However, an algae bloom that covers the surface and gets on lures presents a problem. Grass carp can be one answer. Chemical herbicides are another option, but these can be tricky, and you should consult a biologist before applying them.

Yes, a pond may take money, time and effort. But that first tug on your fishing line will make it all worthwile. ⊠

KING OF Ducks



written and photographed by F. Eugene Hester

CANVASBACKS REIGN SUPREME ALONG NORTH CAROLINA'S COASTAL SOUNDS.

By November they begin arriving in North Carolina's coastal sounds, and by mid-December most of our canvasbacks have completed their migration and are here for the winter. They remain until early March, when they return to their breeding grounds in North Dakota and the prairie provinces of Canada. Some even travel to breeding grounds in Alaska.

North Carolina has had a long and colorful relationship with the highly prized canvasback. In the days of market hunting, it was eagerly sought by gunners and highly prized in the markets. There are vivid stories of hunting adventures from sinkboxes in open-water sounds. Though those are things of the past, the canvasback remains one of our most prized ducks, hunted with modern means and regulations.

Whether in flight or on the water, canvasbacks are stately and regal. They often fly in V-shaped formations, and their flights are usually rapid and direct. They are beautiful birds. The drake sports a contrasting, black-and-white body with a chestnut-red head and red eye. Its wedge-shaped head and bill give it a unique profile.

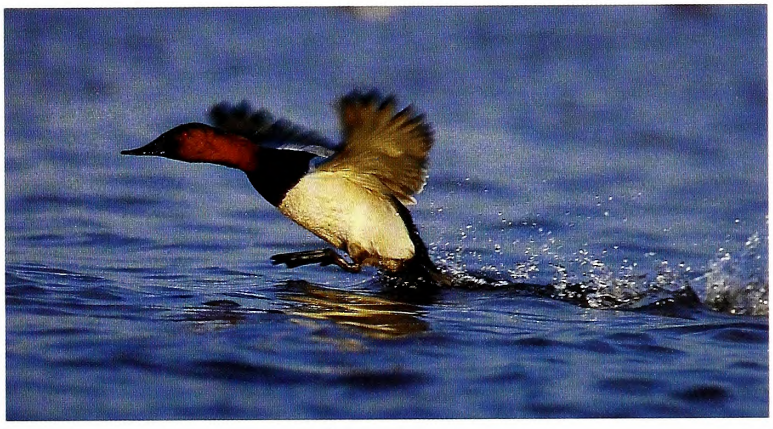
Canvasback numbers, determined by annual surveys on breeding grounds, generally are in the half-million range. The species' nesting requirements are specific—shallow water with cattails or bulrushes. In such habitats, however, canvasbacks face a host of hazards, from fluctuating water levels to predation by birds and mammals. And parasitic egg-laying by other ducks, especially redheads, that deposit eggs in canvasback nests poses a further threat to hatchlings.

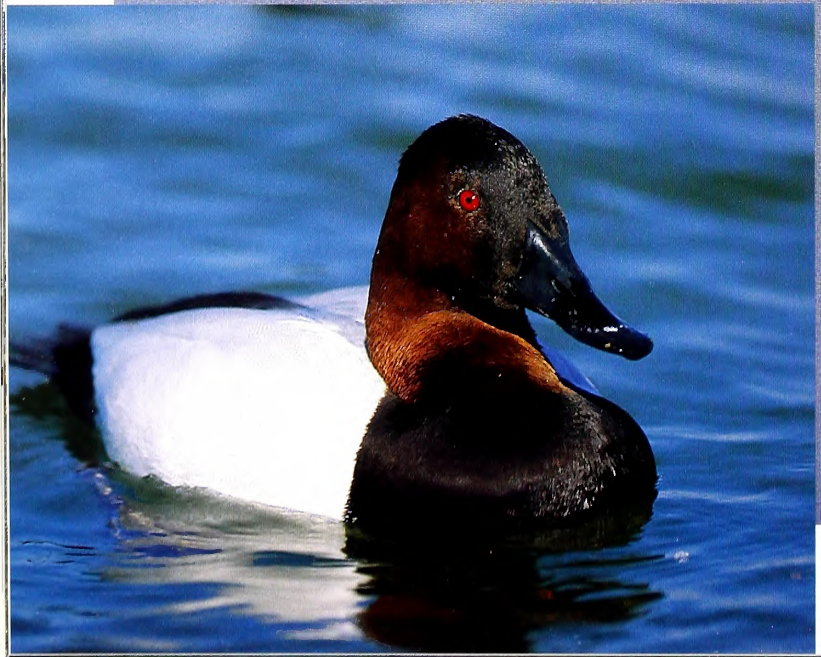
As canvasback numbers fluctuate, the agencies that regulate hunting modify the season to provide additional protection when needed.

A canvasback often rests by tucking its bill under the base of a folded wing after a daily feeding flight (opposite page).

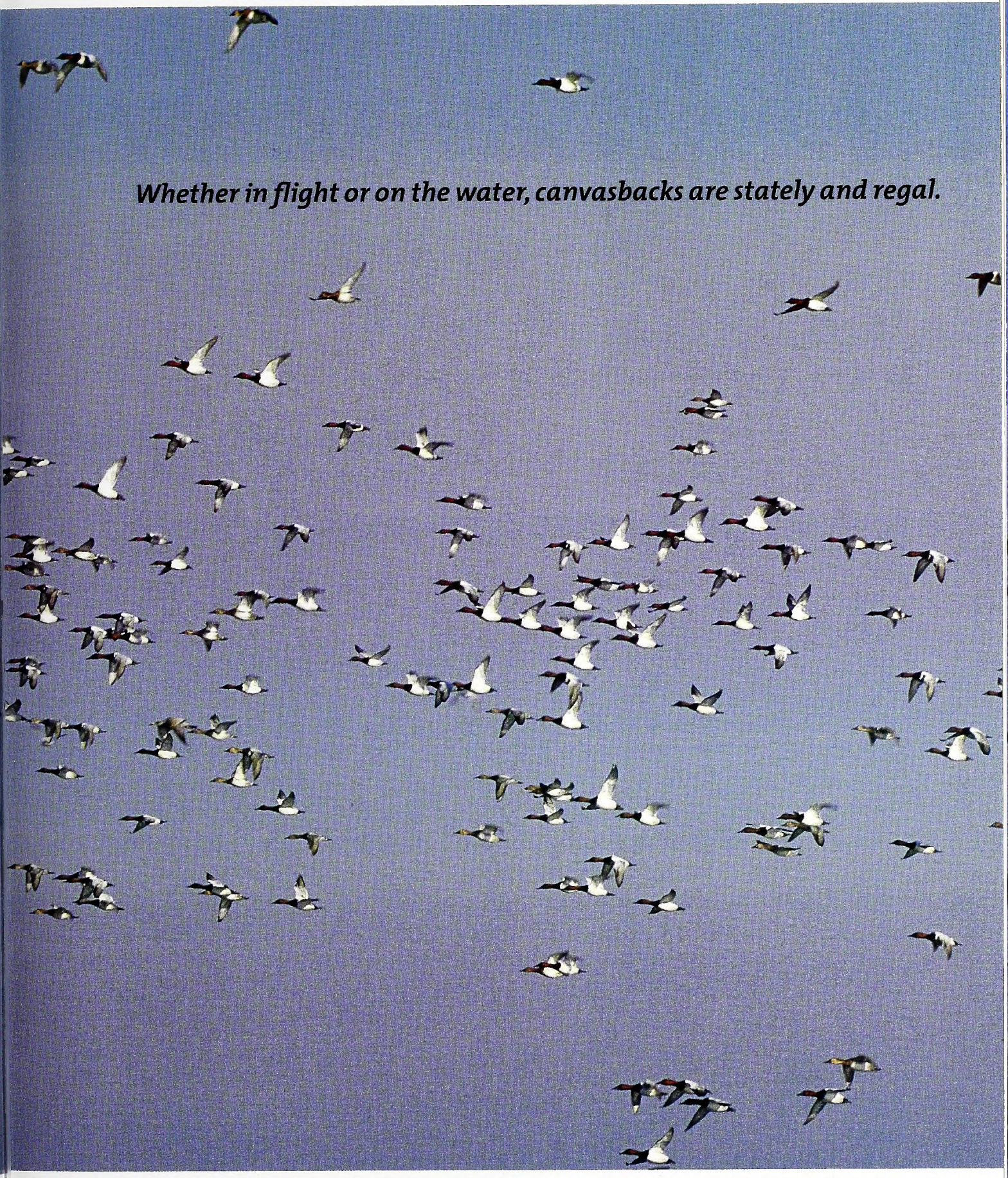
A drake canvasback flies low over the water after a running start. The canvasback, like other diving ducks, gets an assist for takeoff by running on the water.

Canvasbacks congregate in large rafts at favorite feeding places and may dive 20 to 30 feet to obtain wild celery, pondweeds or other aquatic plants.





Canvasbacks often fly in large flocks of hundreds or even thousands of birds, especially when migrating or flying between resting and feeding grounds. Generally regarded as the fastest of ducks, canvasbacks can reach 70 miles per hour in flight.



Whether in flight or on the water, canvasbacks are stately and regal.

glass lizard tales

Often mistaken for snakes, and just as often the subject of folklore, glass lizards are reptiles with a knack for survival

WRITTEN BY JEFF BEANE

The truth is often forsaken when it ruins a good story. Particularly susceptible are snake stories, and one such—familiar to many North Carolinians—features the "glass snake" or "joint snake." According to legend, if a joint snake is cut into pieces, the sections will rejoin later when the danger has passed, leaving the animal none the worse for wear. It's an old tale, and one of its earliest recountings appeared in *A New Voyage to Carolina*, published in the early 1700s by explorer-naturalist John Lawson. Lawson's account contained a rich mixture of fact and folklore about the newly settled North American continent and its native inhabitants—among them a creature the early colonists called the "Brimstone-Snake," which, Lawson said, might also be called "a Glass-Snake, for it is as brittle as a Tobacco-Pipe, so that if you give it the least Touch of a small Twigg it immediately breaks into several pieces. Some affirm that if you let it remain where you broke it, it will come together again."

Three centuries later, that myth still persists, and if you look hard enough, you may find someone claiming actually to have witnessed the rejoining.

Still, it isn't true—no creature can magically reunite severed muscle, bone and nerve tissue. Even skilled human surgeons employing the most advanced medical technology perform such operations only with difficulty and limited success. What's more, the animal behind the myth is not a snake at all, but a legless lizard. And though the true nature of these lizards may not be quite so defiant of physical laws as the stories about them, they are nonetheless interesting animals.

Except for lacking legs, glass lizards are much like other lizards. They share the family Anguidae with a number of more typical-looking lizards, including the alligator lizards of the western United States. Leglessness is not rare among lizards; several other lizard families include species with limbs absent or greatly reduced.

Of North Carolina's twelve lizard species, three are legless glass lizards. All belong to the genus *Ophisaurus*, meaning "snake lizard." The common name "glass lizard" derives from the fact that these lizards' tails, which account for nearly three-quarters of their total length, are fragile and break easily. Therein lies the grain of truth around which the "joint snake" myth no doubt originated. If a glass lizard's tail is struck or grabbed, it may break into several pieces. Reflex action causes the pieces to continue moving for some time, which may distract a predator long enough for the lizard—minus tail—to escape. Unless the body is severed in a place anterior to its tail—which would prove fatal—the animal usually survives.

This phenomenon, known as tail autotomy, is a common defensive strategy, used by all of North Carolina's native lizards. In most species, fracture planes in the caudal vertebrae make the breakaway tails possible. The broken tail pieces die, but the lizard—if it survives—will eventually regenerate its tail, although the process takes time and the new tail will be shorter and usually lighter in color than the original. It is uncommon to find adult glass lizards with complete tails.

The short, regenerated tails so often present have helped fuel another story—that of the "horn snake" or "stinging snake." This myth is more often applied to the mud snake (*Farancia abacura*), which has a tail tip with a stout spine. But rural folklore notwithstanding, no reptile has a stinger in its tail. Occasionally

Slender Glass Lizard

(Ophisaurus attenuatus)

Though they resemble snakes, glass lizards have movable eyelids, external ear openings and a groove along each side of their bodies. The slender glass lizard can be found throughout North Carolina except in the mountains. The species prefers dry, open places and is energetic, especially when handled, which often results in the loss of its tail during capture.

a glass lizard's broken tail may regenerate with a forked tip (the rare "fork-tailed devil snake"). However, few animals are more harmless to humans than mud snakes and glass lizards.

Glass lizards are easily distinguished from snakes upon close inspection. They have moveable eyelids and can blink; snakes have fixed, transparent eye coverings. Glass lizards have a visible ear opening on either side of their heads; snakes lack external ears. A glass lizard's belly is covered with relatively small scales; a snake's has large, transverse scutes. A glass lizard's complete, unbroken tail is proportionately longer than a snake's.

Glass lizards are much less flexible and graceful than snakes; their bodies feel stiff and brittle. This is due in part to the fact that their scales are reinforced with bony plates called osteoderms, which provide protective armor but compromise flexibility. They also have a distinctive groove, called a lateral fold, along each side of their bodies—another feature absent in snakes.

Finally, glass lizards' tongues are shorter, thicker and less deeply forked than those of snakes, and they flick them less. There are also many internal differences, but these readily observable external features easily separate glass lizards from snakes.

Snakes and lizards are actually quite closely related. Fossil evidence indicates that the earliest snakes descended from a lizard ancestor during, or possibly before, the early Cretaceous period, around 120 million years ago. Modern legless lizards can provide us with at least some idea of what the ancestors of snakes may have been like. Glass lizard skeletons have remnants of both pelvic and pectoral girdles. Snakes have lost all trace of a pectoral girdle, although some still possess vestigial pelvic bones.

The most common and frequently encountered of North Carolina's three glass lizards is the eastern glass lizard *(Ophisaurus ventralis)*, which occurs throughout most of the Coastal Plain, preferring pine flatwoods, maritime forests and other sandy habitats. It may be especially common along marshes and in the grassy areas behind the dunes on some beaches, particularly on the Outer Banks and some other offshore islands.

Eastern glass lizards vary in color and pattern. Most juveniles and young adults are shiny bronze, khaki, olive or brownish, with one or more darker stripes down each side of the back and several white vertical bars along the sides of the head and neck. The belly may be yellow or whitish. Adult females often retain this pattern, but mature males usually become greenish, with a uniform speckling of light and dark spots, a yellow belly and an ochre-colored regenerated tail tip.

The slender glass lizard *(O. attenuatus)* is probably the longest lizard native to the United States, commonly exceeding 3 feet in length. The two largest known specimens are both from North Carolina, with head-body lengths of 359 and 347 millimeters. Both are preserved in the North Carolina Museum of Natural Sciences' collections. Each is missing most of its tail, but with tails intact, both might have exceeded 4 feet.

The slender glass lizard can be distinguished from the eastern by the presence of a dark stripe down the center of its back and thin stripes along its sides below the lateral groove. It is brown or bronze in color, usually with a whitish belly.

The slender glass lizard occurs over much of North Carolina's Coastal Plain and lower Piedmont, with a few records from Cherokee and Clay counties in the southern mountains. It appears inexplicably absent from some areas with apparently suitable habitat, notably portions of the central Piedmont and Sandhills. Apparently abundant nowhere, it occurs in a variety of habitats, seemingly preferring old field situations in the Piedmont and pine flatwoods in the southeastern Coastal Plain.

When handled, slender glass lizards are usually energetic in their attempts to escape. They thrash about more vigorously than other species, and their tails break more readily.

Our smallest glass lizard, the mimic glass lizard *(O. mimicus)*, was only recently recognized as a species. It resembles the slender glass lizard, and the two are not easily distinguished by any single characteristic, but by a strong combination of subtle features—most of them scale differences. Those familiar with the species may learn to recognize it based on its narrow head, the characteristic light and dark speckling on the heads and anterior bodies of mature males and the usual lack of distinct stripes below the lateral fold (such stripes are generally present on the slender glass lizard).

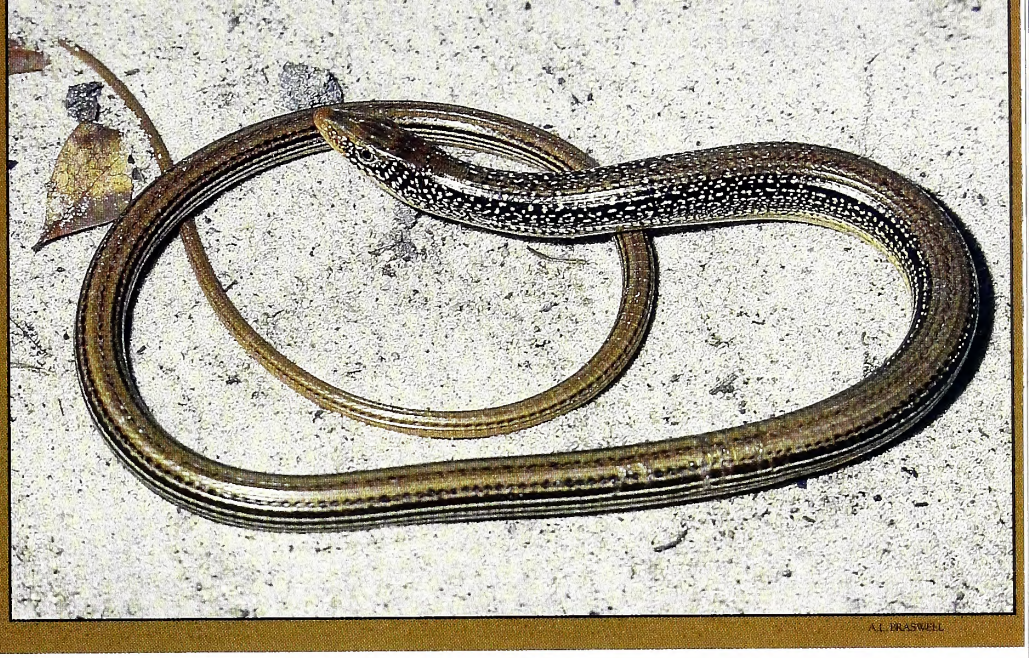
Eastern Glass Lizard
(Ophisaurus ventralis)

The most common of North Carolina's three glass lizards is the eastern glass lizard, which occurs throughout most of the Coastal Plain, preferring pine flatwoods, maritime forests and other sandy habitats.

Mimic Glass Lizard

(Ophisaurus mimicus)

The mimic glass lizard is North Carolina's smallest glass lizard. It closely resembles the slender glass lizard and is distinguished by very subtle differences. Found only in seven Coastal Plain counties in North Carolina, the rare species prefers pristine pine flatwoods—a vanishing habitat.



A.L. BRASWELL

The mimic glass lizard occurs along a narrow belt of primarily longleaf pine forest from Carteret County, North Carolina, to Pearl River County, Mississippi. It is considered uncommon to rare throughout its range. In North Carolina, it has been found in seven counties in the southeastern Coastal Plain and is state listed as a species of special concern. It apparently requires pristine pine flatwoods—habitat that is rapidly vanishing throughout the Southeast.

Glass lizards are carnivorous, eating almost any small animal they can catch and overpower with their strong jaws, including insects, spiders, crustaceans, earthworms, snails and small vertebrates. They hunt largely by sight, responding to moving prey, but may also use the tongue and Jacobson's organ, as snakes do, to locate dead or motionless prey. Large insects such as grasshoppers, crickets, cockroaches and beetles are important in their diet. Captives will usually eat newborn mice. I once found the tail of a six-lined racerunner (our fastest lizard) in the stomach of a road-killed eastern glass lizard from Scotland County. On another occasion, I watched a captive eastern glass lizard eat an anole that was temporarily placed in the same container by a friend who was unaware that glass lizards would eat other reptiles.

The breeding habits of glass lizards are poorly known. Most mating takes place in spring. Females usually lay a single clutch of four to 20 white, leathery shelled eggs in a damp, sheltered spot, such as beneath a rotten log, often guarding the eggs until they hatch in late summer or early fall. Hatchlings are independent after that.

Glass lizards probably face numerous predators, although actual records of predation are scarce. In North Carolina, snakes are the only glass lizard predators that have been documented; these include the racer, coachwhip, coral snake and eastern and mole king snakes. But undoubtedly, many mammals, birds and other opportunistic predators also eat them.

Besides the broken tail trick, glass lizards have a few other defensive strategies. They are generally secretive, often burrowing or hiding under objects, and are well camouflaged in vegetation. They can move rapidly and vanish quickly. I once saw an eastern glass lizard retreat to the edge of a lake and disappear underwater. Their armored scales also provide some protection, and they can bite, although few of the many I have handled have attempted to do so.

Glass lizards are primarily diurnal but often venture forth at dusk, and occasionally at night. They are frequently encountered on roads and may also be found beneath logs, boards or scrap metal. Eastern glass lizards are sometimes found under debris along beaches.

Glass lizards, especially males, may be territorial. Captives may fight if caged together. Once, in Dare County, I watched two male eastern glass lizards chasing and repeatedly biting at one another before finally fleeing in separate directions.

All three of our species have suffered much habitat loss and fragmentation in the last century. Many perish on roads, and many are killed by persons harboring irrational fear of legless reptiles. Pesticides and other pollutants, as well as domestic animals such as house cats, dogs and pigs, undoubtedly claim many glass lizards. Introduced fire ants are a potentially serious threat.

Of our three species, eastern glass lizards appear most tolerant of human activities. They may flourish in the yards of beach houses, and viable populations still occur in vacant lots in some heavily developed coastal communities. Slender glass lizards are more sensitive to habitat alteration but sometimes thrive in old agricultural fields and some other disturbed areas. The mimic glass lizard appears uncompromising in its need for large, unfragmented tracts of pine flatwoods. In our state, it primarily exists in such shrinking refuges as Croatan National Forest, Green Swamp Ecological Preserve and Marine Corps Base Camp Lejeune.

Glass lizards are potentially long-lived. I have maintained a captive eastern glass lizard—a mature adult when captured—for well over 16 years, and another of that species lived for nearly 15 years at the National Zoo in Washington, D.C.

Glass lizards have been special to me ever since my first encounter with one when I was 9 years old. Walking with my cousin along a Brunswick County beach, I came across what I initially thought was an eel, then a snake, lying on the sand very near the ocean. Upon realizing that it was a legless lizard, I pounced on it despite my cousin's dire warning, "That snake's gonna bite you!"

It never did bite, though I carried it around for at least an hour, managing somehow not to break its nearly complete tail, before finally releasing it.

Though I have since encountered many glass lizards, I never tire of seeing them. The sight of one of these well-adapted reptiles basking along a path never fails to brighten my day. Occasionally, I find myself wishing there were indeed species that could break into pieces and then reconcile their fragments. More often, however, I wish that one particularly dominant species could reconcile itself with Nature and learn to react to her creatures not with fear and tall tales but with understanding, respect and appreciation. ⊠

Long snouts. Needle-sharp teeth. Hungry again. Shrews and moles are incessantly on the go.

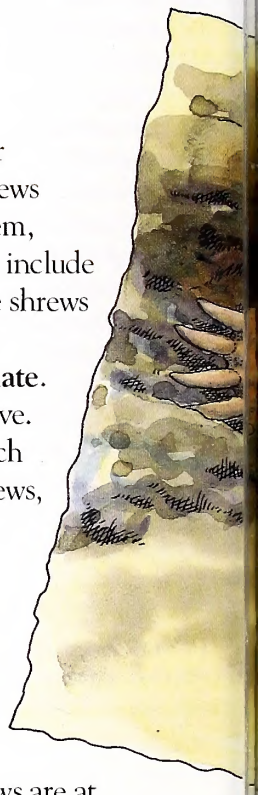
Vigor in Velvet

written by Julie Dunlap / illustrated by Consie Powell / nature activity by Anne M. Runyon

LIFE IN THE FAST LANE

Sometimes mistaken for mice, shrews and moles won't be caught munching cookies in your cabinets. But these tiny creatures do have huge appetites. Voracious **predators**, moles and shrews belong to a group of insect-eating mammals called **insectivores**. To them, hornet **larvae** and lawn grubs are gourmet treats. Daily feasts may also include earthworms, spiders, centipedes, snails and other **invertebrates**. Some shrews can slow their victims with snakelike **venom**.

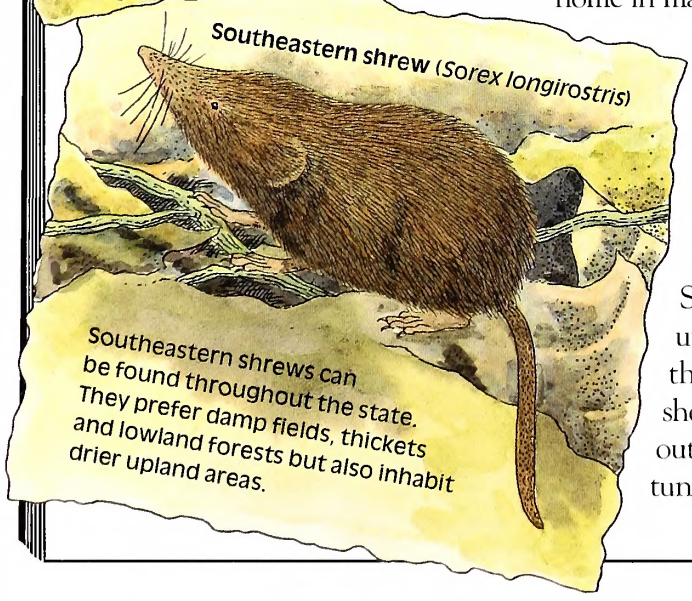
During food shortages, bigger mammals can rest and even **hibernate**. But insectivores must eat day and night, season after season, or starve. Their small bodies need continuous fuel to stay warm, so they search for food almost constantly, resting only for very short periods. Shrews, especially, live at a frantic pace, their hearts beating over 1,000 times per minute. Born naked and helpless, moles and shrews grow up fast. Young of some species can leave their nests three weeks after birth. Few insectivores live much longer than 18 hectic months.



MOLE VERSUS SHREW

Because their prey live amost everywhere, moles and shrews are at home in many habitats, from rocky mountains to well-mowed yards. But how can you tell the two types of animals apart? All insectivores are small, but shrews can be minuscule. Africa's pygmy white-toothed shrew weighs less than a dime. Typically, North America's 30 shrew species have slimmer bodies, longer tails and more fur on their snouts than our seven species of moles.

Check the animals' feet to spot the biggest difference. Shrews have narrow, five-toed paws, suitable for scurrying under leaf litter, crawling through hollow logs or tunneling in the snow. By contrast, a mole's front feet work like built-in shovels. Broad paddles with stout claws, mole feet also turn outward. Powered by strong chest and shoulder muscles, moles tunnel through soil almost as if swimming.



MASTER DIGGERS

Moles build burrow systems with two main tunnel types. Shallow runways zigzag through rich upper soil layers, where the resident mole patrols for earthworms and other **prey**. Pushed-up soil from these tunnels makes ridges above ground. Molehills are signs of deeper passages, leading to nesting and napping chambers, safe from cold and most predators. When frost drives insect larvae farther below the surface, many fall into the deep tunnels, soon to be munched by the mole. Digging almost 4 meters per hour, a young eastern mole can carve a brand-new burrow in a few days. Burrow systems can be used for years by generations of moles and are sometimes "borrowed" by mice or shrews.

Short-tailed shrews (*Blarina brevicauda* and *Blarina carolinensis*)

Northern short-tailed shrews (*B. brevicauda*) inhabit areas in the mountains and Coastal Plain. Southern short-tailed shrews (*B. carolinensis*) live in the Piedmont and Coastal Plain. Both are fairly large shrews and are very similar in appearance.

North Carolina is home to nine species of shrews and three species of moles.

Eastern mole (*Scalopus aquaticus*)

Eastern moles live wherever they find well-drained loam or sandy soil. In North Carolina, coat colors range from silver-gray in the Coastal Plain to brownish black in the mountains.

UNDERCOVER WORK

Fancy feet are just one special trait, or adaptation, that helps moles thrive underground. One head-to-toe trait is especially useful: their velvety fur. Moles, plus some shrews, boast ultra-soft coats of flexible, short hair. The dense fur lies smooth in any direction, no matter how much the animals turn and twist in their narrow passages.

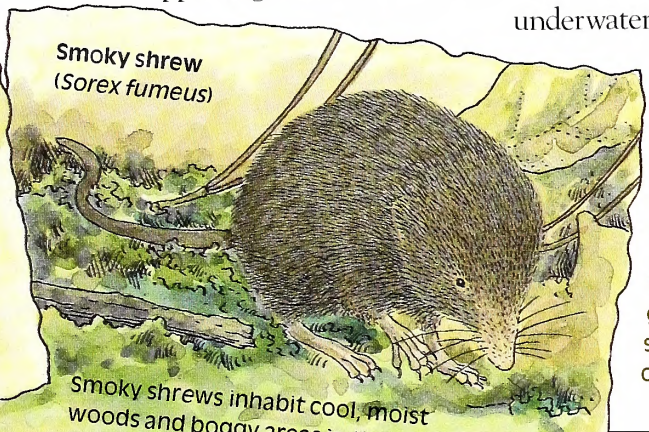
Shrews and moles have tiny eyes, often with poor eyesight, and rely instead on their other senses. Some shrews use a bat-like technique of **echolocation** to locate prey and avoid obstacles in the dark. But an insectivore's finest sense is often touch. Moles, especially, are well equipped to feel for meals. Hairlike structures, called **vibrissae**, sprout from each mole's face, tail and backside of paws. The vibrissae alert the mole to vibrations that might mean dinner—or danger.

The most touch-sensitive insectivore of all may be a North Carolina native, the star-nosed mole. Only experts can tell some insectivore species apart, but the star-nose is distinctive. A ring of 22 fingerlike tentacles encircles its nostrils. Packed with nerves, the odd appendages move constantly when the water-loving mole dives underwater. Its talented snout detects motions of **aquatic** insects, snails and small fish.

Least shrew (*Cryptotis parva*)

Least shrews are common all over North Carolina, using many habitats, but they are seldom seen because of their secretive habits and tiny size.

Smoky shrew (*Sorex fumeus*)



Smoky shrews inhabit cool, moist woods and boggy areas in the mountains. They especially like birch and hemlock forests.

Moleskin was once in great demand to make super-soft gloves and other clothing.

Hairy-tailed mole (*Parascalops breweri*)

Hairy-tailed moles are most frequently found in hardwood or coniferous forests at elevations above 2,000 feet.

LINKS IN A CHAIN

Hungry fish sometimes gobble star-nosed moles in ponds or streams. Owls and hawks swoop down to snatch moles or shrews that venture above ground, and foxes and skunks dig down into their burrows. Musky odors protect some species from predators, but insectivores are important prey animals. Many kinds of wildlife depend on them to survive.

Yet, some gardeners declare war on insectivores, trapping and poisoning as many as possible. They see burrow ridges as scars on their lawns and think the meat-loving animals are devouring their plant roots. Scientists, though, say mole burrows enrich the soil by mixing nutrients between layers and improving water and air circulation. Just as important, insectivores hunt Japanese beetle larvae and other plant-eating insects. As both predators and prey, moles and shrews are key links in nature's **food chain**. People who understand insectivores are happy to share their yards and wild lands with these undercover heroes.

What Does It Mean?

aquatic: pertaining to water
echolocation: a sensory system using echoes of high-pitched sounds to tell direction and distance of objects
food chain: system of feeding relationships, with each predator depending on its prey to survive
hibernate: to spend time in an inactive state, with lowered body temperature and reduced metabolism
insectivores: animals or plants that eat insects and other invertebrates
invertebrates: animals without internal skeletons or backbones
larvae: wormlike young of insects after they hatch from eggs
predators: animals that hunt and eat other animals
prey: any animal that is hunted and eaten by other animals
venom: poison secreted by an animal, often while biting its prey
vibrissae: whiskerlike hairs able to detect motion

Read and Find Out

- *Wild Life: The Remarkable Lives of Ordinary Animals* by Edward Kanze, Crown, 1995.
- *Mammals of North America (Princeton Field Guides)* by Roland Kays and Don E. Wilson, Princeton University Press, 2002.
- *The Smithsonian Book of North American Mammals* edited by Don E. Wilson and Sue Ruff, Smithsonian Institution Press, 1999.
- "Moles" by Sy Montgomery, *Animals*, Spring 2001.
- "What Every Gardener Should Know... about Moles" by Cheryl Long, *Organic Gardening*, April 1998.

In *Wildlife in North Carolina*:

- "An Ounce of Trouble" by Doug Elliott, February 1981.
- "Life in the Basement" by Jeff Beane, February 1999.
- "A Nose by Any Other Name" by Mary Kay Clark, May 1999.
- "Taming of the Shrew" by Roger Powell, August 1999.

It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

Owl Pellets teaches students to construct a simple food chain and identify prey by bone and skull remains.

Who Fits Here? teaches students to understand how each ecosystem has characteristic life forms adapted to live there.

Star-nosed mole (*Condylura cristata*)

Moist meadows, fields, swamps and woods in the mountains are common haunts of star-nosed moles. They are occasionally found in the Coastal Plain. Burrows near streams sometimes lead directly into water.

The star-nosed mole's nose may be able to detect electrical fields given off by prey animals.

Get Outside

Do some undercover investigating. Though common in many habitats, insectivores are rarely seen. In winter, check for shrew tunnels in the snow and tiny tracks with tail-drag marks. After the snow melts, look for mole ridges and molehills in lawns and meadows. And whenever you walk in the woods, look for trees where owls might roost. On the ground you may find owl pellets, undigested hair and bones of prey animals coughed up in compact wads. Carefully pull the pellet apart with two forks and you may discover the skull of a mole or shrew What species is it? Experts can often identify insectivores by their teeth, so contact a local museum to see if someone can tell you what you've found.

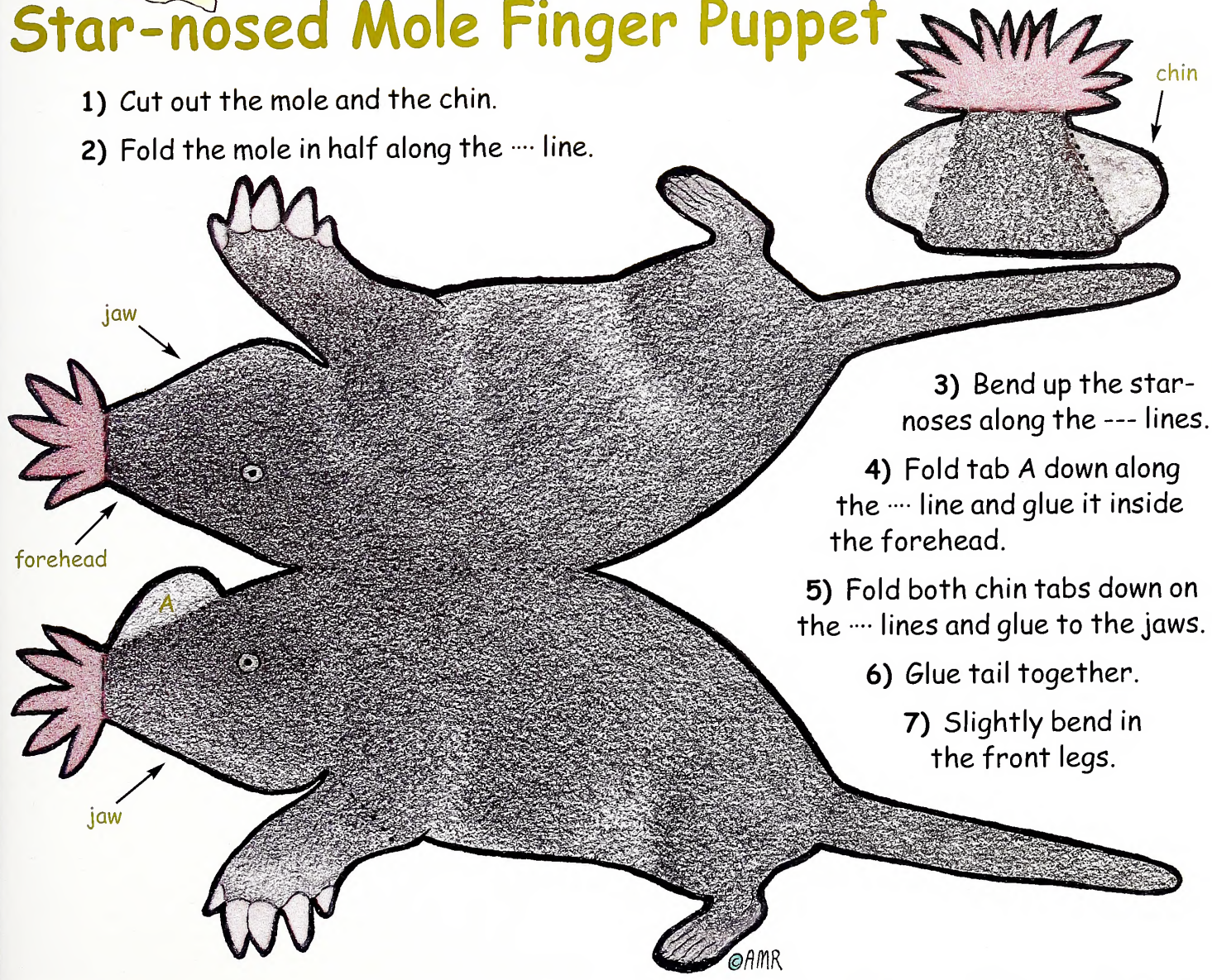
Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the Commission's Web site at www.ncwildlife.org and click the link for education/workshops.

Star-nosed Mole Finger Puppet

1) Cut out the mole and the chin.

2) Fold the mole in half along the ···· line.



3) Bend up the star-noses along the --- lines.

4) Fold tab A down along the ···· line and glue it inside the forehead.

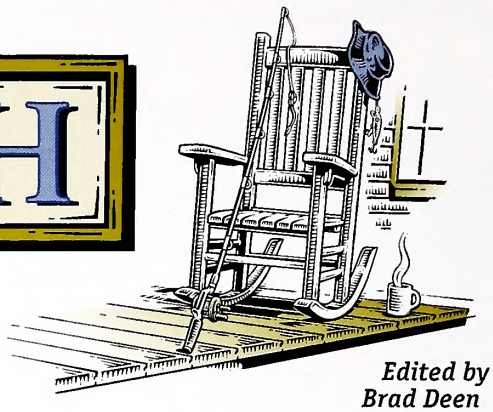
5) Fold both chin tabs down on the ···· lines and glue to the jaws.

6) Glue tail together.

7) Slightly bend in the front legs.

BACK PORCH

News and Wildlife Notes



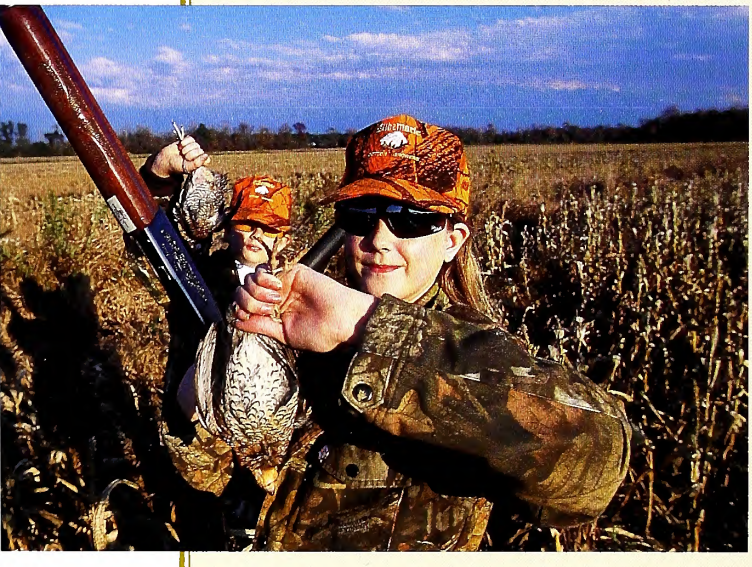
Edited by Brad Deen

Wish Comes True for Youngster

Fighting a life-threatening disease, a young girl from Washington County made an appeal for one wish—the kind of hunt many kids dream of. What she received was an almost overwhelming outpouring of gifts, support and opportunities.

Ashley Ambrose, 13, of Creswell learned of the Life Hunts one Saturday morning while watching "Buckmasters Whitetail Magazine," a hunting-related television show. Buckmasters sponsors these special hunts for critically ill and disabled children.

JODY DUGGINS



She wrote to the organization, describing her bout with cystic fibrosis as well as her desire for one special hunting trip. Buckmasters

JODY DUGGINS

then contacted Terry Boyce, a North Carolina Wildlife Resources Commission hunter education volunteer from Elizabeth City. Boyce, who had conducted a Life Hunt the previous year for a young boy suffering from cancer, put the word out that a little girl needed a wish to come true. The community responded with a compassion typical for North Carolinians. Not only would Ashley have her wish granted, but her 11-year-old sister, Hollie, would be included, as well.

This past November, Pesco Hunt Club, which Boyce is a member of, donated an all-day deer hunt, where Ashley was able to take a nice six-point buck. The Albemarle chapter of Quail Unlimited kicked in two days of quail hunts at the Lazy Days Hunting Preserve, which provided the bird dogs. Shotguns for the hunt were loaned to the girls by the Wildlife Commission's enforcement division.

Following one of the quail hunts in which both girls bagged birds, Boyce beamed with delight. "You see, I was diagnosed 12 years ago with terminal caner, and I'm still here. It has inspired me to do for others," he said.

The Elizabeth City chapter of Ducks Unlimited invited the Ambrose family to their banquet, free of charge, and contributed a duck hunt for the two sisters. Then the National Wild Turkey Federation's Coastal Callers club stepped up with a turkey hunt this spring. Any game the girls wanted mounted will be taken care of by Hunter's Dream Taxidermy.

For the fishing segment, the River City Fraternal Order of Police put on a fishing trip at Owens Pond. The Wildlife Commission's Division of Inland Fisheries gave both girls their own freshwater rod and reel combinations. To top if off, Pirates Cove Marina teamed up with Seahunter Charters to provide an offshore fishing trip.

During their three-day stay in Elizabeth City, the two girls and their father, Terry, received complimentary accommodations at Microtel Inn & Suites. To get them around during their three days in Elizabeth City, Courtesy Ford loaned the

JODY DUGGINS

***Cystic fibrosis** patient Ashley Ambrose, 13, was able to hunt deer, duck and quail during a wish-fulfilling hunt.*

group a 2003 pickup filled with gas. Meals were provided through a series of picnics hosted by the Elizabeth City Parks and Recreation Department.

The youngsters were also taken on a tour of the Elizabeth City Coast Guard Aircraft Repair and Supply Center, where they received gifts and a collection of money. Then they went on a plane ride at the Elizabeth City Regional Airport.

But that wasn't all. At a luncheon provided by Tony's Italian Restaurant, both girls were showered with gifts. The Wildlife Commission's Division of Conservation Education presented a gift basket filled with educational materials. They received camouflaged clothing from two Wal-Marts, custom-monogrammed saltwater rods from TW's Bait and Tackle, T-shirts from the Elizabeth City Chamber of Commerce, turkey calls and seats, caps, cups and more.

"I think there's only one word to describe it, and that's just outstanding," Terry Ambrose said. "These girls are just overwhelmed. Everybody has just bent over backwards to make sure these kids enjoyed themselves."

To qualify for a Life Hunt, a person must be age 21 or younger and have a life-threatening illness that is known to shorten life span. For information on how to apply, contribute or volunteer, contact David Sullivan, Buckmasters director of disabled services, at (205) 339-2800, e-mail dsullivan@buckmasters.com.

—Chris Powell

Squirrel-proof Your Birdfeeder

The dead of winter is a popular time to keep the birdfeeders stocked. Natural food sources have been depleted; and for many birds, your feeder is the only game in town. A feeder full of seed is guaranteed to attract various feathered species and, unfortunately, others maybe not so welcome.

Though they probably have a healthy cache of acorns and pinecones to see them through the winter, squirrels won't miss an opportunity to dine at your feeder. It would be perfectly fine if squirrels ate with the manners of birds—pecking a little here and there, leaving plenty for the next visitor. But squirrels are more like a person who crashes a party, drinks all the beverages and eats all the food. I've watched them swing on my feeder like a trapeze while they gorged on seed, letting the rest spill to the ground below. A full feeder one minute was gone the next, and I contemplated getting out the old Red Ryder BB gun for a little target practice.

But there are easier ways to squirrel-proof your feeder. The National Wildlife Federation offers several tips to keep these bushy-tailed bandits away. If your bird feeder is on a pole, mount about a foot of aluminum duct tubing around it. The squirrel will encounter the slick surface and slide right down. For jumping squirrels, buy a clear, plastic dome and place it directly above a hanging feeder. Squirrels planning a raid from the top will slide right off. Also, you can switch from sunflower seeds to safflower seeds. The change in diet is popular with cardinals, house finches, chickadees, nuthatches and mourning doves, but not squirrels.

If you want to attempt to draw squirrels away from your feeder, simply impale an ear of corn on a nail driven through a board. Attach the board to a tree where squirrels can reach it.

As for me, I'd rather watch them slide down the pole.

—Chris Powell

State Preserves Alligator River Lands

The state recently preserved two large tracts along the environmentally crucial Alligator River: a 5,000-acre game land and an 8,000-acre addition to a coastal reserve.

The Alligator River Game Land is now a part of the N.C. Wildlife Resources Commission's 2-million-acre inventory of game lands. "Public land acquisition is key to our goal of providing expanded sporting opportunities to the public," said Wib Owen, the Wildlife Commission's game lands manager. Dale Davis, a commission wildlife management technician, said that although waterfowl and deer abound, "we expect black bear to be the main attraction for North Carolina hunters."

The 5,401-acre site in Tyrrell County was known as the Cedar Ridge property. Funding for the $1.3 million acquisition came through the state's Clean Water Management Trust Fund. The Nature Conservancy, a nonprofit organization, helped broker the deal between the Wildlife Commission and landowners C. Ben Bass and William Jay Fields of Kitty Hawk.

GRAPHIC BY JANE OSLISLO

The Nature Conservancy also was instrumental in swinging the deal for Roper Island, an 8,270-acre undeveloped island in neighboring Hyde County. The $1.95 million deal will make Roper Island a part of Preyer Buckridge Coastal Reserve, an 18,000-acre nature preserve on the Alligator River. The N.C. Division of Coastal Management did not buy Roper Island itself. Instead, the agency bought a conservation easement that prevents future development. Both the Alligator River tract and part of the Buckridge Reserve are proposed to be added to the N.C. Game Lands Program in July 2003.

Besides protecting the outstanding water quality of the Alligator River basin, the land acquisitions will protect old-growth forests of bald cypress and Atlantic white cedar, pocosin and other invaluable wetlands and numerous species of rare, threatened or endangered wildlife, such as the red wolf, red-cockaded woodpecker and alligator. The estuaries also provide spawning waters for declining fish species, such as the Atlantic and the short-nose sturgeon, as well as more common species such as herring and shad.

Cerulean Warbler Could Be Threatened

The cerulean warbler, whose numbers have declined with eastern forests, could soon appear on the federal threatened species list.

MASLOWSKI WILDLIFE PRODUCTIONS

***Loss of** unbroken forest habitat could place the cerulean warbler on the federal list of threatened species (female pictured).*

The U.S. Fish and Wildlife Service has begun a species status review after finding indications of a need to list the small, migratory songbird. The latest round of scrutiny was the result of a petition by 28 environmental organizations, headed by the Virginia-based Southern Environmental Law Center, in October 2000. Earlier that year, the Fish and Wildlife Service determined that the warbler, despite declining populations, did not warrant threatened status.

Launching a new review, the federal wildlife agency has called for comments from other state and federal agencies, environmental groups, scientists, businesses, private citizens and other interested parties. Those comments will become part of a more extensive evaluation of the bird's status by the federal agency, which will determine whether to list the cerulean warbler.

Named for the male's brilliant blue plumage, the cerulean warbler inhabits woodlands east of the Mississippi River and winters in South America. In both hemispheres, the warbler—like many other neotropical bird species—has lost much of its natural habitat through deforestation.

To comment on the cerulean warbler or its habitat, write to Field Supervisor, Ecological Services Field Office, U.S. Fish and Wildlife Service, 608 E. Cherry St., Room 200, Columbia, MO 65201, or fax comments to (314) 876-1914. Comments must be received by Jan. 31.

Calendar of Events

SUNDAY, FEB. 2

Groundhog Day at the N.C. Museum of Natural Sciences, Raleigh, from noon until 3 p.m. will feature the emergence of Sir Walter Wally, as well as discussions and live specimens of other winter-beating animals. Call toll-free (877) 4NATSCI, or log onto www.naturalsciences.org.

FRIDAY–MONDAY, FEB. 14–17

The Great Backyard Bird Count, an Audubon Society-sponsored event in its sixth year, asks knowledgeable amateurs to help the professionals take stock of North American birds. E-mail sconyne@audubon.org, or log onto www.birdsource.org/gbbc.

SATURDAY, FEB. 15

The Wake Audubon Society will sponsor a valentine-themed field trip to watch the courtship flights of the American woodcock. Log onto www.mybirdlist.com/wakeaudubon.html.

FRIDAY–SATURDAY, FEB. 21–22

The N.C. Bowhunters Association will hold its 17th annual convention and banquet at Atlantic Beach. Call (919) 690-1953 (day) or (919) 693-2560 (nights, e-mail ncbowhtr@nr.infi.net or log onto www.ncbowhunter.com.

SATURDAY, FEB. 22

The North Carolina Wildlife Habitat Foundation will hold its Seventh Annual N.C. Wildlife Extravaganza at the Grandover Resort in Greensboro. Proceeds go for wildlife conservation. Call (336) 375-4994.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to chris.powell@ncwildlife.org, or call (919) 733-7123, Ext. 262.

Drought Effects Linger in Western Piedmont

Heavy fall rains brought jubilation across North Carolina, but the water deficit may not be closed in some areas, particularly the western Piedmont.

Greensboro, which even in good years used to have water restrictions in place, lifted all such measures in mid-November. Rain had just refilled the city's once-depleted main reservoir, gushing over the dam for the first time in 18 months.

N.C. WILDLIFE RESOURCES COMMISSION

***Badin Lake on** the Yadkin River is filling again, but not everything is back to normal after the historic drought.*

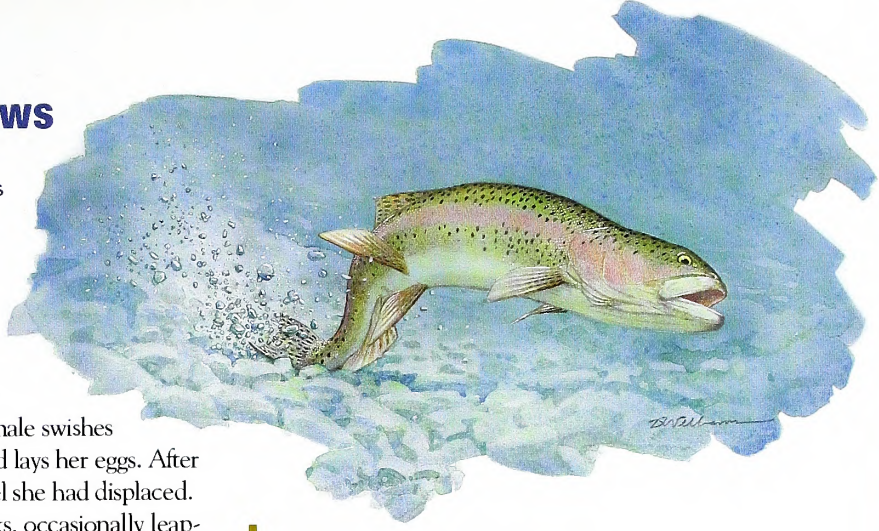
Weather scientists had recorded lower-than-normal rainfall throughout the state for four years. Water shortages became acute last summer, especially across the Piedmont, where much of the state's rapidest growth has occurred. Higher demand, combined with lower supply, forced dozens of cities and towns to ration water or prevent its use entirely for activities such as lawn irrigation and car washing.

But not everywhere is suddenly flush with water. Despite soaking rains throughout the fall, many Charlotte-area rain measurers still reported annual precipitation deficits of 3 1/2 inches or more. And although streams and rivers appear replenished, the drought's worst damage may have been to underground aquifers, which can take years or decades to recharge.

Nature's Ways

Spring Rainbows

written by Brad Deen
illustrated by David Williams



This time of year—when spring is imminent but the chill still plunges like a dagger to the bones—is when our mountain lakes and streams begin to flash silver and pink with the spawning runs of rainbow trout.

As water temperatures reach 41 degrees Fahrenheit, rainbow trout begin their headlong swim toward spawning waters. The female swishes her tail over the gravelly bottom to build a nest, called a redd, and lays her eggs. After the male fertilizes the eggs, the female covers them with the gravel she had displaced. Some lake-bound rainbows will also navigate up into feeder creeks, occasionally leaping waterfalls to reach them. Most lake trout, however, merely head for shallow waters.

Rainbow trout abide by a different biological clock than brown and brook trout, which spawn in the fall. But the eggs of all three trout species hatch around the same time, in mid- to late spring. Water temperature triggers the hatching.

Like their fall-spawning cousins, rainbow trout mark seasonal transitions with color. Just as breeding male brookies famously develop an orange-red belly to match the turning foliage, the iridescent greens, reds and yellows of spawning rainbow trout foreshadow the coming explosion of botanical color. Like their namesake, rainbow trout portend better days ahead.

Hummingbirds Appearing Unseasonably

ruby-throated hummingbird, female

Bird researchers have recorded an increasing number of hummingbird sightings along the East Coast in late fall and winter, when most birds already have flown south for the winter. The winter sightings have given researchers reason to rethink what they know about migration patterns of hummingbirds flying from western states and Canada to Central and South America.

"Twenty or 25 years ago, if you said you saw a hummingbird in November, people would be wondering if you had been tipping the sherry," said Mary Gustafson, an ornithologist with the U.S. Geological Survey in Laurel, Md.

Susan Campbell, a research affiliate with the N.C. Museum of Natural Sciences, last winter verified reports of hummingbirds along the coast and as far inland as Shelby. Most were either rufous or ruby-throated hummingbirds, but Campbell also managed to band a calliope and a broad-tailed. And the first-ever sighting of a broad-billed hummingbird was recorded in the state.

Sheri Williamson, author of the new *Peterson Field Guide to Hummingbirds of North America*, said the sightings may be due to variations in the birds' internal compasses, coupled with increased public interest in hummingbirds.

For more information about hummingbirds in North Carolina, log onto www.naturalsciences.org/nchummers/.

MASLOWSKI WILDLIFE PRODUCTIONS

Book Review: Don't Shoot the Decoys

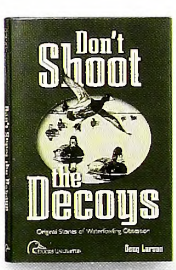
What waterfowler doesn't take pleasure in the memories surrounding the survival of another duck season custom-built for the insane? Duck hunters who haven't flirted with hypothermia, almost sunk a boat or stepped thigh-deep in mud aren't—well—duck hunters.

For those who can't get enough, fear not; Ducks Unlimited recently published *Don't Shoot the Decoys: Original Stories of Waterfowling Obsession*. Doug Larsen, the author and a lifelong duck hunter, shares first-person accounts of some of his more humorous misadventures. And though some tales are belly-laugh funny, he provides a nice balance with a reverence for both a species and a sport he loves:

> "Charlie fitted the head of a drake to the body of a hen, and the head of a hen to the body of a drake. He then placed both off to the side of the decoy rig. By luck or happenstance, the day he did this the ducks decoyed beautifully, and after the hunt he opined that the dead mallards and gadwalls in our blind did not seem to notice the pair of unisex decoys. I was shocked beyond comment at the time, and could not believe we had gotten our shooting, given this serious breach of realism. Now, more than 12 years later, I refuse to change those two decoys back to their proper selves. Instead they are placed out as a pair and have become a reference point in the spread. 'Mark left, ten o' clock, low over the cross-dressers.'"

Anyone who enjoys a good hunting story will devour this book. So stoke the fire, pour a snort of your favorite spirit, read *Don't Shoot the Decoys* and wish you were shivering in your duck blind, instead.

—Chris Powell



Don't Shoot the Decoys: Original Stories of Waterfowling Obsession *by Doug Larsen, 236 pages, hardcover, 2002, $22.50, available by calling 1-800-45-DUCKS or by visiting* ***www.ducks.org/bookstore/books.asp.***

JODY DUGGINS

Court Upholds Property Seizure

North Carolina's Court of Appeals has upheld the state's seizure of 2,200 acres for a state forest addition.

The court in November ruled that a lower court was correct in dismissing a suit by developers who had hoped to build an upscale, gated community on the scenic mountain land. An attorney for the three plaintiffs said he might appeal the appellate ruling to the state Supreme Court.

The 2,223-acre site, which straddles Henderson and Transylvania counties, was at the time surrounded by Dupont State Forest. The state in October 2000 agreed to pay $12.5 million for the tract, which contains picturesque waterfalls where scenes from the movie "The Last of the Mohicans" were filmed. The addition has quickly become the centerpiece of Dupont State Forest, drawing more than 2,000 visitors weekly.

Locals Could Foot Higher Share for Beach Projects

The Bush administration has proposed reversing the ratio of funding for beach restoration projects, requiring local governments to pay a larger share.

Currently, local funding pays for only about one-third, or 35 percent, of U.S. Army Corps of Engineers beach renourishment projects. Federal dollars pick up the remaining two-thirds, or 65 percent. But federal environmental officials, advancing an idea that began in the Clinton White House, have proposed switching the formula.

The North Carolina Coastal Federation supports the idea for two reasons. First, the new ratio would more accurately reflect who benefits from Corps beach projects. And second, the greater expense could force coastal communities to consider more carefully whether beach nourishment is necessary.

KEN TAYLOR

***The federal government** may reduce funding to renourishment projects.*

But officials in many beach towns—particularly those with smaller commercial tax bases—predict disaster if local governments have to pay more. "Most of the coastal communities cannot survive without this existing cost-share ratio," North Topsail Beach Town Manager Don Betz told *The* (Jacksonville) *Daily News*.

On Patrol

ILLUSTRATED BY JACKIE PITTMAN

Sometimes, you just have to grin and bear it.

Wildlife officers Wes Barger and Brent Ward found a bear carcass on the side of the road near Falls Lake last winter. Clipped to the bear's ear was a tag from Maine. A call to Maine wildlife officials ascertained that a hunter from Wake County had bagged the bear the previous September. The hunter told officers that the last he saw of the bear was when he took it to a taxidermist in Wake Forest.

The taxidermist said the hide was not in good shape, so he threw it out. He hadn't mentioned this to the hunter, who was still awaiting a full body mount. The officers charged the taxidermist with what they could—littering over 15 pounds.

Letters to the Editor

Dear Wildlife,

I read your article in the October issue about your mountain bear hunt. I think a great follow-up story would be one on a coastal bear hunt in Beaufort or Hyde County. Let people see the different methods of bear hunting. I understand that there are some really big bears down there.

—*Oscar Dean, via e-mail*

Dear Wildlife,

I just finished reading the wonderful article in the November issue on the Alligator River National Wildlife Refuge. I relived a paddling trip that my wife, Nanci, and I did with Dru Ferrence several years ago. She is a delightful person, and the area is the type that we try to search out and paddle.

You did a good job. It makes me want to get back there as quickly as possible. How about some more articles about remote, wild, natural areas like that?

Keep up the good work.

—*Jack LaMarre, via e-mail*

Catch Us at these Numbers

1-800-662-7137 to report violations of hunting and fishing laws

1-800-628-3773 (NC VESSEL) for boat registration and titling

1-800-675-0263 for hunting dates and shooting hours for migratory game birds

1-888-248-6834 (2HUNTFISH) to purchase most licenses with VISA or MasterCard using a touch-tone telephone

1-800-446-8663 (I GOT ONE) to report big game harvests

Connect to the Commission's online Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $49,394,252.27

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

N.C. WILD STORE

Winter weather? Don't despair. Explore the wild from your favorite chair.

What's that little snake with a red belly?

The redbelly snake is one of North Carolina's smallest snakes; it ranges from just 6 1/2 to 12 inches. Although it doesn't bite, it can curl its upper lips in a snarling manner. Is it the little snake in your garden? Our new snake posters can help you identify the snakes you encounter and appreciate the role each one plays in nature. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for venomous and protected species. As a set, the two posters cover all of North Carolina's 37 snake species.
Each poster is 24" x 36".

redbelly snake (Storeria occipitomaculata)

Each poster may also be purchased separately.

LIVEBEARERS
$6 ITEM CODE **P5**

EGG-LAYERS
$6 ITEM CODE **P8**

SNAKES OF NORTH CAROLINA POSTER SET
$10 ITEM CODE **P26**

Rivers of Life

Sale

The natural history of North Carolina's rivers spans millions of years, but our choices for the next few decades will determine their survival. Published in Nov. 1999, this special issue of *Wildlife in North Carolina* chronicles the history and prospects of the state's 17 major river basins. Some of the state's finest outdoor writers and photographers are represented in this 128-page guide to the rivers that link people to each other and wildlife. Includes maps, graphics and a list of organizations that can help you to become a river crusader.

Now at a special price while quantities last.

RIVERS OF NORTH CAROLINA
$5 ITEM CODE **M11**

Cape Fear River Basin

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Each poster can also be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

A11

A3

A7

A6

▲ Embroidered Caps

Wildlife in North Carolina Caps
Exclusive designs and magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Each poster can also be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Each poster can also be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Items not pictured:

All Things Are Connected

Video and Activity Guide. Based on Chief Seattle's 1855 speech, the film's focus is on environmental ethics. Accompanied by *This Land Is Sacred* teacher's guide, this film is a must-see for everyone. $22 ITEM CODE **W3**

Bird Houses and Feeders

This 8-page illustrated guide to building birdhouses includes construction notes and dimensions, as well as tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE **M6**

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE **M2**

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set.
$2 ITEM CODE **M5**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

left front design

▲ **Largemouth Bass.** Add some history to your fishing trips with our bass tee. This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12XLG** (extra large)
A12LRG (large) **A12XXL** (extra extra large)

left front design

▲ **Snow Geese.** Our waterfowl tee recalls times past, when the Cape Hatteras lighthouse stood close to Diamond Shoals. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front. Celebrate conservation efforts with this white, all-cotton tee.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo. Grab a gobbler with this tan, all-cotton tee.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**

These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail their quarry and some that tree as well.
Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

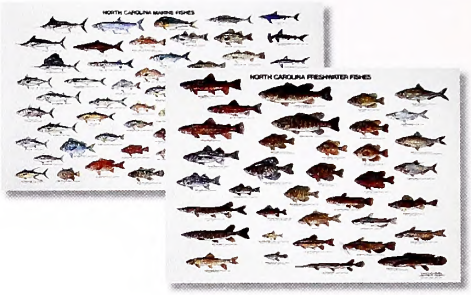
Sporting Traditions Posters ▶

Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams.
Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

Fishes of North Carolina ▶

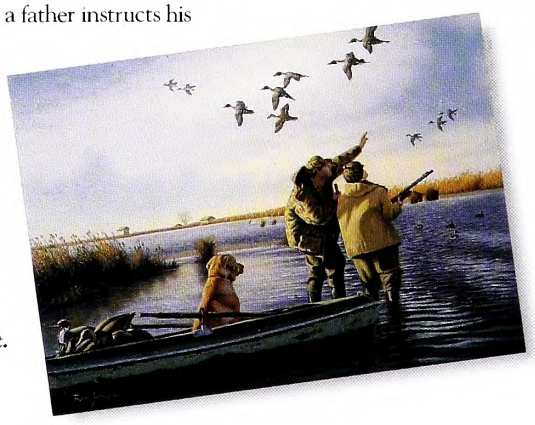


Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE P9

2002 Migratory Waterfowl Print and Stamp Set ▼

Dawn breaks, and a flock of pintails settles on the brackish waters of Pamlico Point. In the gray light, a father instructs his son to focus on just one bird before shooting. Signed by artist Ron Louque, "Traditions at Pamlico Point" will stir memories of a first hunt for many a waterfowler. Your purchase of this limited-edition set supports wetlands research and restoration. Overall size: 12" x 14"; image size 6 1/2" x 9".



This item not subject to 15% discount.

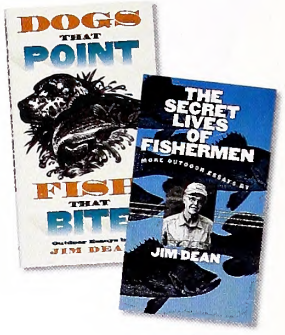
$145 ITEM CODE DSP02

Dogs that Point, Fish that Bite ▼

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

Hardbound $19.95
ITEM CODE M8

Paperback $10.95
ITEM CODE M12



The Secret Lives of Fishermen ▶

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound $24.95
ITEM CODE M13

North Carolina WILD Places: A Closer Look ▶

Book and Posters Set.

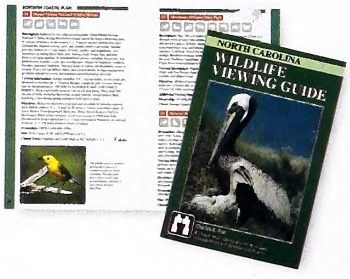
Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a N.C. WILD Places map featuring the art of Jackie Pittman make this set a valuable teaching tool.

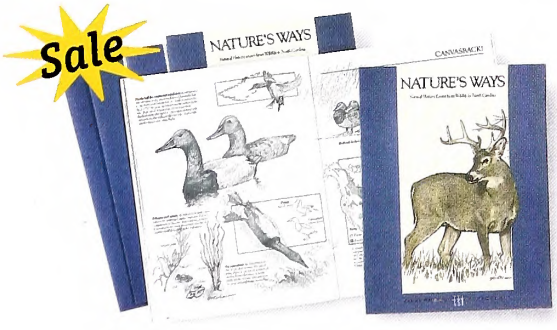
$16 ITEM CODE E6

North Carolina Wildlife Viewing Guide ▼

From Cape Hatteras to the Great Smokies, the *North Carolina Wildlife Viewing Guide* will lead you to 90 of the state's premier wildlife viewing locations—and better your chances of seeing wildlife once you get there.

$5.95 ITEM CODE N6





Nature's Ways Collection ▲

If you're looking for drama and science combined, "Nature's Ways" essays from *Wildlife in North Carolina* will deliver. Includes a new comprehensive index to all six volumes so you can find related essays easily.

Half-price while they last.

Boxed Set. $15 ITEM CODE M10

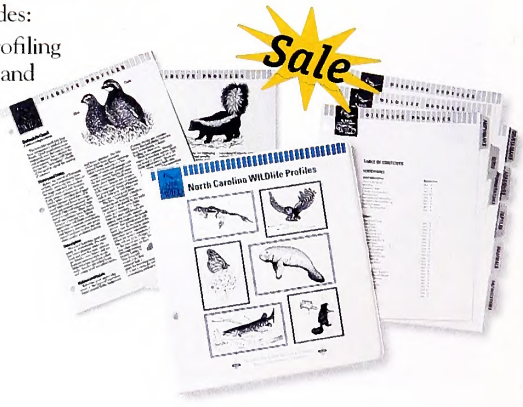
Unboxed set. $13.75 ITEM CODE M9

N.C. WILDLife Profiles Binder & N.C. WILDLife Profiles Sets 1–12 ▼

This top-quality 3-ring binder includes:

- 120 illustrated fact sheets, each profiling an animal's history, status, habitat and behavior, and also containing a range map. Half-price.
- Tab dividers that organize 12 sets of wildlife fact sheets by class.
- A table of contents, index and instruction sheet.

$15 ITEM CODE W17



WILDLIFE COMMISSION SPOTLIGHT

moving mussels

The southeastern United States has the greatest diversity of freshwater mussels in the world—that's the good news. The bad news is that these animals have become increasingly rare, and several species have become extinct in the past century thanks to human activities. Land clearing for development and agriculture has caused rivers and streams to become silted, choking native mussels. Runoff and chemicals in our waters poison mussels, while dams isolate mussel populations and change the natural flows of streams. As a result, many North Carolina streams have lost their native mussel populations.

Through efforts to reduce water pollution and protect waterways with forested buffers, many streams are now clean enough to support native mussel populations. Being filter feeders, the freshwater mussels themselves can help further clean streams by removing sediment, nutrients and harmful bacteria. Unfortunately, it may take hundreds of years for these creatures to naturally repopulate streams through a complex process that requires the movement of fish hosts. (See the mussel life-cycle graphic).

RODNEY FOUSHEE

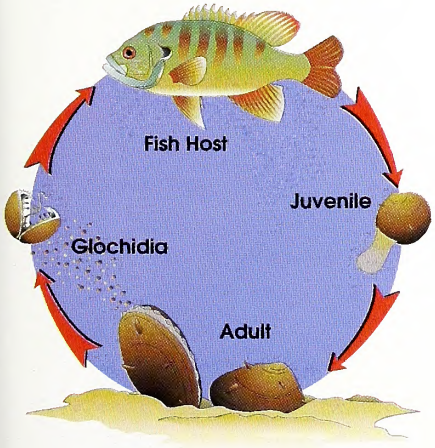
KEN TAYLOR

Wildlife Commission biologists collect and tag freshwater mussels in Caswell County before relocating them to a nearby stream that is devoid of the native mussels.

That's why the N.C. Wildlife Resources Commission is working to help restore freshwater mussel populations across the state. For the past two years, commission biologists have been collecting common native mussel species from stream reaches that will be disturbed by road projects or streams that have plenty of native mussels. Biologists then tag and release the creatures in nearby streams that contain no mussels. The hope is that the mussels, once relocated to their new homes, will survive and reproduce—speeding up the recovery process.

The pilot project, which targets streams in the Yadkin-Pee Dee, Roanoke and Cape Fear river basins, is funded through a grant from the N.C. Clean Water Management Trust Fund. If the project proves successful, the Wildlife Commission may consider additional relocation efforts in the future to help rare and endangered mussel species recover.

Life Cycle of a Freshwater Mussel



GRAPHIC BY ERIN HANCOCK

Feeding Frenzy

A raft of canvasbacks dives for food on a frigid coastal sound. To learn more about these regal waterfowl that call North Carolina home for the winter, see page 18.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

50% recycled,
30% post-consumer content

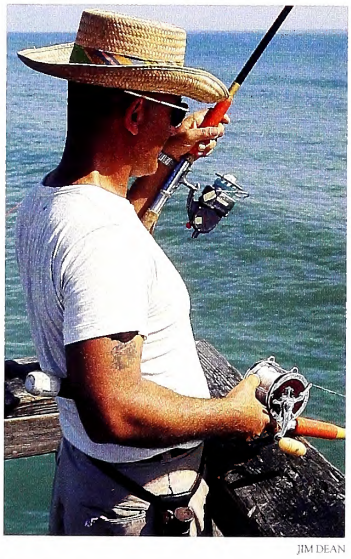
7:67/3

WILDLIFE IN NORTH CAROLINA

MARCH 2003 $1.50

What Pete Taught Us

by Jim Dean



JIM DEAN

Pete Leo, 1970

"Everyone on the Emerald Isle Pier began using Pete's rig, and word quickly spread.

Another Arctic weather front was roaring toward Emerald Isle from the west, but for a few hours at least, only an occasional light drizzle was expected from the low, ragged clouds. I hitched up the boat and swung by Pete Leo's house on the back side of the island.

"Get your mess together," I told Pete. "They're catching speckled trout in the White Oak River near Stella."

Fishermen in other boats were having good luck with live shrimp, and Pete did well using a curly-tail grub. To my surprise, I managed to catch nearly as many with a fly rod and a flashy, copper-colored fly. Along with the specks were some sublegal flounders, but everything quit biting after the tide changed. Pete and I lingered, sharing old memories.

"We've been fishing together a long time," I mused, reflectively. "Back in the old days, it would have astonished us to catch trout and flounder on flies. We didn't even have soft-plastic grubs then. Been a lot of changes since my folks built their cottage down here in 1959."

"Yep, you were just a pimply kid when you first started fishing with us on the Emerald Isle Pier. It was Earl Thompson's Steel Pier then. That was before Ken Heverly bought it," Pete said. "There was no bridge, no ferry, not even any road 2 miles west of the pier."

"Those were good times," Pete continued. "We were free-floating live baits—mostly snapper blues, menhaden, mullet or thread herring—for king mackerel off the end of the pier under big corks or balloons. El and Rachel Tavasso and Elmer Bland were part of that bunch. We caught a lot of kings; I caught a tarpon, too. Do you remember that we used a flying gaff on a long pole to land 'em? Nobody free-floats live bait anymore. Too many fishermen and tangles. Everybody now uses two rods—an anchor rod and a second rod with the bait line clipped to the anchor line."

"Yeah, and I know who invented that rig," I said.

Pete laughed: "Well, I guess you do, but you're one of the few."

I didn't say anything, but I was thinking: *That's a bit of angling history that ought to be preserved.*

For the record, Pete Leo developed the two-rod system that is now used almost universally on piers along the Atlantic and Gulf coasts for kings, cobia, tarpon and other big gamefish. In the 1960s, confounded by the inability to ride herd on an increasing number of rambunctious, free-floating live baits hell-bent on tangling every line, Pete figured out a technique that would anchor the bait in one spot and also keep it fluttering enticingly near the surface.

I remember sitting on the hot planks one summer day watching Pete put the finishing touches on his idea. He rigged one rod, the anchor rod, to cast a heavy sinker as far as possible. He rigged a second rod with a float, leader and live bait, then hitched a simple sliding clip over the anchor line, clamping the clip to the swivel at the top of the float. This permitted the float rig to slide down the anchor line to the water and be held in place with only a foot or so of leader and the bait in the water. When you got a strike, the clip released your fishing line so you could fight the fish. It worked great, though we soon realized that the float was no longer necessary. Some fishermen also began to use rubber bands on the clips to secure the fishing line. The rubber bands would break easily when you got a strike.

Essentially, this is the same two-rod technique used today. Before Pete came up with this idea, the only other way to anchor a bait was with something called a "slide rig," which employed one rod and a sliding sinker above the cork. But you couldn't cast it far enough; it didn't hold the bait on the surface, and there was a tendency for the line to break when you had a strike.

Everyone on the Emerald Isle Pier began using Pete's rig, and word quickly spread. Within a year or so, his two-rod anchor rig was in use from Hatteras Island south through the Carolinas into Florida and the Gulf.

Ironically, Pete seldom fishes for kings anymore. The Emerald Isle Pier was removed after severe damage from hurricanes Fran and Floyd, and nowadays he's just another friendly angler at Bogue Pier plugging for Spanish or bait-fishing for pompano.

But if you find yourself sharing the rail with someone who's catching lots of fish using ancient fiberglass rods and homemade lures, you should know that it just might be the guy who revolutionized big-game ocean pier fishing.

National wildlife refuges *aren't just for waterfowl. These areas provide habitat for numerous other creatures, as well, from songbirds to southern leopard frogs and waterbirds such as the lesser yellowlegs (left).*

JODY DUGGINS

***In addition to serving** as rest stops for migrating waterfowl, some refuges allow hunting. These hunts are tightly controlled to prevent over-pressuring the waterfowl and to provide quality shoots.*

JODY DUGGINS

birds. North Carolina is no exception; refuges have played a big role in the waterfowl tradition of the state as well as the nation.

The 1920s and '30s saw great declines in waterfowl numbers, a decline that caught the attention of Knapp, a wealthy New Yorker and hunter. Knapp's hunting lodge, which still exists on the Mackay Island refuge, was the site of some of the early work in waterfowl management. His game bird organization also included contemporaries such as J.N. "Ding" Darling, the father of the federal duck stamp, and banker J.P. Morgan.

Though our refuges were created to protect and improve bird populations, hunting has become a key activity at many of these locations. For decades, hunters came to the Lake Mattamuskeet National Wildlife Refuge to hunt Canada geese in Hyde County.

JODY DUGGINS

In the 1930s, President Franklin Roosevelt created the Civilian Conservation Corps to put unemployed young men to work on our public lands. At Mattamuskeet, the corps converted the pumphouse into a hunting lodge. Left from the days when investors dreamed of draining the lake to open up fertile farmland, the pumphouse provided accommodations for travelling hunters. The lodge is still there today and was placed on the National Register of Historic Places in 1981. Renovation work is scheduled to begin in the coming months.

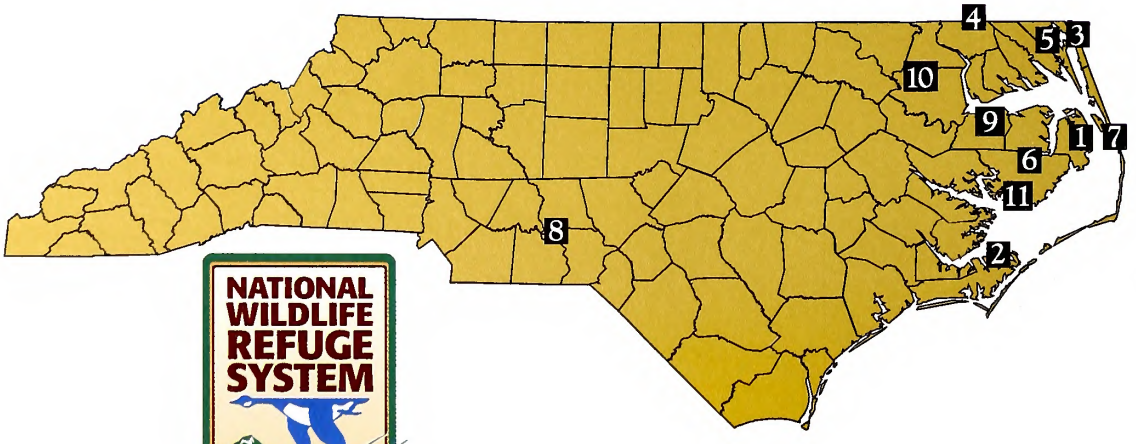
In Dare County, the brackish-water ponds that make up part of the waterfowl and wading bird habitat on the Pea Island National Wildlife Refuge also were constructed by the Civilian Conservation Corps.

The Pee Dee National Wildlife Refuge, though hours from the coast, was also created for waterfowl. "Pee Dee was set aside in 1963 to give more habitat to the southern James Bay Canada goose. In the early 1960s, about 18,000 of them passed through the area," said J.D. Bricken, Pee Dee's refuge manager.

Although steeped with hunting and conservation tradition, our refuges are not strangers to controversy in a modern world where numerous stakeholders have their own ideas and opinions about land management. The reintroduction of the red wolf at the Alligator River National Wildlife Refuge resulted in heated dialogue among refuge personnel, local farmers and wolf supporters. Much of that tension has been worked through. From only 14 red wolves left in the world, the population in lowland North Carolina now numbers more than 100.

To the east, at Pea Island National Wildlife Refuge, controversy over a jetty led one U.S.

NATIONAL WILDLIFE REFUGES



NATIONAL WILDLIFE REFUGE SYSTEM

1. Alligator River
2. Cedar Island
3. Currituck
4. Great Dismal Swamp*
5. Mackay Island*
6. Mattamuskeet
7. Pea Island
8. Pee Dee
9. Pocosin Lakes
10. Roanoke River
11. Swan Quarter

*Part in Virginia

senator to move to take land away from the national wildlife refuge system. In the 1970s, Congress directed the U.S. Army Corps of Engineers to install jetties along Oregon Inlet on the Outer Banks. Nevertheless, Congress has also told the Fish and Wildlife Service that refuge activities must support wildlife, creating a situation that pits federal law against federal law. Commercial fishermen say the jetties will make the inlet safer; biologists say the jetties will harm commercial and recreational fish stocks; geologists say the jetties will interrupt the natural movement of sand along the barrier islands. Former Sen. Jesse Helms introduced legislation to turn the affected part of Pea Island National Wildlife Refuge over to the state, paving the way for the jetties. The legislation didn't pass, and the issue has bounced around the halls and offices of government for years. A resolution is still being sought.

Despite controversy over management issues, the opportunities these refuges provide and their corresponding economic impacts can't be ignored. According to a 2001 Fish and Wildlife Service study, more than $1.1 million was spent to view wildlife in North Carolina that year, and national wildlife refuges are a key part of those activities.

A black skimmer glides inches above the north pond at Pea Island National Wildlife Refuge, its lower bill skimming the surface of the water, searching for a fish. From a nearby dike, bird watchers have binoculars glued to their faces. Pea Island is a birder's paradise. Its 12 miles of undeveloped beach is home to shorebirds, but it's the brackish-water ponds that really attract the birds. In the summer, these ponds are filled with wading birds. And when fall comes around, these same waters are filled with ducks, geese and swans. Located on the Outer Banks, this is the premier national refuge in the state for viewing wildlife, attracting more than 2 million visitors a year.

The Pea Island National Wildlife Refuge plays the lead role in the Outer Banks' annual Wings Over Water birding festival, drawing birders from up and down the East Coast each fall, after the summer crowds have left. To celebrate the arrival of the tundra swans, Mattamuskeet National Wildlife Refuge hosts Swan Days, an event that includes tours of the refuge, birding trips and photography workshops.

In addition, Pocosin Lakes National Wildlife Refuge has become a key player in the ecotourism development of the Columbia area, with its visitor center sitting on the banks of the idyllic Scuppernong River and its participation in the annual Scuppernong River Festival. That doesn't even include the opportunities for hunting and fishing and the money pumped into local economies by hunters and fishermen on these refuges. And the lottery for duck blinds on Mattamuskeet National Wildlife Refuge can draw well over 1,000 entries, bringing hunters from neighboring counties and states.

"The lake is just a natural waterfowl area. Because it's a large shallow area, much of the lake is accessible to ducks and geese. Probably 80 percent of the lake bottom has submerged aquatic vegetation," said Mattamuskeet National Wildlife Refuge manager Don Temple. "We're probably one of the better waterfowl hunts. Most of the hunters we have give us really good feedback. Even if they don't get anything, they have a good experience just being out there."

Behind the wheel of his truck, Bricken points out his efforts to improve habitat at Pee Dee National Wildlife Refuge. "We're trying to get it [to] where we're planting food plots with native warm-season grasses," he explained, reflecting a trend among land managers to look to plants native to the landscape. On the far edge of the field, Bricken points out a small logging operation. Where the fields meet the forest, staff are thinning trees along the edge, creating a more open transition zone and greater habitat diversity between the field and the forest. The result of this management is a place for wildlife that hunters, anglers and observers can enjoy. "We probably have about as good a quail hunt as anyone," Bricken said.

At this first centennial of the refuge system, the Fish and Wildlife Service claims there is a refuge within an hour's drive of every major metropolitan area in the United States. What sets the Pee Dee refuge apart from others in the state is that it sits an hour east of Charlotte, the state's largest city. All the other refuges in North Carolina are near the coast.

The 2000 census revealed that North Carolina's population is growing at a much faster rate (21.4 percent) than the rest of the nation (13.1 percent). That means that space for quality habitat is shrinking, and the number of people looking for a quality outdoor experience is increasing.

Thus, like Pee Dee, all our national wildlife refuges will become increasingly important areas. They provide space for wildlife and destinations for people looking for a bird they've never seen before or a chance to let their children feel the pull of a largemouth bass. ⊠

JODY DUGGINS

JODY DUGGINS

Don Temple, *manager of Mattamuskeet National Wildlife Refuge (above) and J.D. Bricken, manager of Pee Dee National Wildlife Refuge, are responsible for thousands of acres of wildlife habitat.*

THE LAST "Cook-up Shack"

WRITTEN BY T. EDWARD NICKENS

PHOTOGRAPHED BY JODY DUGGINS

Where else can you get herring sunny-side up, cremated or hard as a brickbat?

The road to the Cypress Grill in the two-stoplight town of Jamesville scurries down a sandy slope shaded by tall pine and sweet gum trees, their branches draped with Spanish moss. You'll know quickly if you've gone too far. The asphalt dead-ends in a boat ramp, which leads to the coffee-with-cream-colored Roanoke River. Here, the river flows through one of the South's largest intact bottomland forests, its banks a greening veil of cypress and tupelo gum trees. The water flows so swiftly past that the river seems to stand still, until a log or a leaf comes hurtling by.

At the corner of the road and the river is a little shack of a place. Its origins as an open-air shelter aren't hard to figure. It's built of weathered board-and-batten cypress siding, with a tin roof and hinged shutters propped open to reveal a black placard with orange lettering: "YES we're OPEN." Seeing the sign, I breathe a sigh of relief. I'm not too late.

Whether I'm fishing for shad, paddling a backswamp or bird-nerding the Roanoke's lowlands during the spring warbler migrations, I make a stop at the Cypress Grill every chance I get. For some 65 years, the ramshackle diner has propped open its doors for a few short months, January through April, to dish up an ephemeral pleasure: river herring netted on their spawning runs from the open Atlantic. Historically, untold legions of the fish surged up the Roanoke, Chowan, Tar-Pamlico and other eastern North Carolina rivers each spring, supporting a seasonal fishery that shipped salt-cured herring across the South by the millions of pounds. Locals, too, flocked to greening river-banks to nail together makeshift "cook-up shacks" where the fish were fried over an open fire or a propane burner from an old tobacco-curing barn.

The foot-long river herring were plentiful beyond imagining. So many fish thronged through coastal rivers that colonial planters used them for fertilizer. "When you plant yo' corn, put a herrin' to de hill / If dat don't do it, de good Lawd will," ran two lines in an old herring fisherman's chantey. In the early 19th century, haul seine operations opened all across Albemarle Sound country. Using nets up to 2,500 yards long, fishermen would set the seines with rowboats, then haul them in by windlasses turned by hand or capstans powered by mules and horses, and later by steam engines. Later on, giant pound nets were developed that remain a mainstay of North Carolina fishing operations.

Sally and Leslie Gardner

***From January** through April, the Cypress Grill in Jamesville is a bustle of activity. The dish of choice for hungry patrons is fried herring, hushpuppies and coleslaw.*

Pound netting involved setting a long, straight "lead" of net hung on stakes across a body of water. This lead acted as a fence, funneling fish down the lead and into a heart-shaped pound from which they could not escape. Large haul seine and pound-netting operations could employ dozens of workers, many of them local farmers working part-time.

Another large-scale commercial fishing technique was the use of fish wheels on the Roanoke. These large, water-powered paddlewheels were outfitted with big baskets that scooped migrating fish out of the water. Before the turn of the 20th century, some 500 fish wheels cranked along the Roanoke. All told, the commercial fishing operations in the Roanoke and Albemarle regions defined the early-spring labors for many residents. David Hunter Strother, who wrote under the pen name Porte Crayon in the mid-19th century, described the enormity of the North Carolina fishing operations as an "unceasing war upon the shad and herring."

By 1880, the Roanoke region's herring fishery landed perhaps a billion herring each spring. Not too many years ago you could take a washtub down to most any eastern North Carolina fish house and fill it with herring for a dollar. No longer. Pollution and overfishing have reduced herring numbers to all-time lows. These days, if you want a taste of old-time herring, you head down the hill at Jamesville and hope your timing is right.

Like mine. "Oh, yessir, we have herring today, sure do," Leslie Gardner tells me. He stands between shelves groaning with tea pitchers and homemade pies. The interior of the Cypress Grill is crowded, homey; the air is spiced with the scent of vinegar and fried fish. There are a half-dozen booths painted stark white and eight tables with straight-back chairs. A hand-lettered poster hawks tickets to the Jamesville EMS and Rescue Raffle. Sunlight bores in through a few knotholes in the siding. Leslie is lean and gray-haired, with salt-and-pepper eyebrows and faded jeans held up by a 1972 Eisenhower silver dollar belt buckle. He and his wife, Sally,

have rented and run the Cypress Grill for 27 years, bolting the doors each season just in time to put in a new tobacco crop. Originally constructed as a private cook-up shack about 1936, the building burned down in 1946 and was soon rebuilt. It's the only seasonal herring diner left in eastern North Carolina.

When the Gardners first took over the Cypress Grill, herring were an easy score. The two Gardner boys launched skiffs at first light, netting a day's worth of fresh fish before cleaning up for school. These days, Leslie loads up his pickup truck at fish houses on the nearby Chowan River, making the run every single day the restaurant is open. "You know how it is," he tells me. "If I ever skipped a day, then I'd want to skip two or three. I told myself way back that I wouldn't start that. There ain't no need to have old fish."

Especially when you need so many. On a pretty spring day, 500 herring will take a hot dip at the Cypress Grill, most under the watchful eye of a short and chipper lady named Julia Price. "Other than raisin' young-uns," she says at a near-holler over the boisterous sizzle of frying fish, "I've been right here, off and on, for I reckon 20 years." It takes a certain alchemy to turn an overgrown, oily, bone-filled sardine into a regional icon, and Julia's happy to play sorceress. First, she explains, notches are slashed into the fish, perpendicular to the backbone. The cuts let the hot oil bubble deep into the flesh, softening the herring's bones. Some folks request fish barely fried—this is called "sunny-side up"—so that the skin can be scraped away to reveal the flesh beneath. But far more ask for their order "cremated," cooked so long that the fish turns a deep chestnut brown and hardens up, so that you can eat a 1-pound herring, bones and all. "They want it burnt slap up to cracklin's," Julia says, with a can-you-believe-it look on her face. "It don't matter to me, though. I don't eat the things, anyway."

Just then, waitress Linda Perry sticks her head through the order window. She's laughing hard and holding an order ticket. "Fellow out here says he wants his herring 'a total loss,'" she says. "Wants 'em brickbat hard."

Julia grins and scoops three freshly fried fish back into the pans. "Brickbat hard, huh? Well, we'll see about that!"

To be sure, river herring is an acquired taste. And for many Cypress Grill regulars, it's a taste acquired during a time now past. Every bite of fish evokes an era when these silvery harbingers of spring were counted on to keep a belly full. Eastern North Carolina has always been a poor region. For the first half of the 20th century, tenant farming and sharecropping made cash money hard to come by. As late as 1943, fewer than 35 percent of the region's farms had electricity. Without refrigeration, fresh meat was only an occasional pleasure. It wasn't uncommon for salt-cured herring to find its way to the plate three times a day. "Fish and collards," grimaces Sally. "That's what people lived on."

"Fellow out here says he wants his herring 'a total loss,'" she says. "Wants 'em brickbat hard."

The large commercial fisheries for herring supplied country stores and urban grocers near and far, but herring were so numerous and easy to catch that anyone could share the plenty. Variously called salt-cured, pickled or corned herring, they were kept by just about everyone in eastern North Carolina. Each fish was cleaned, gutted and headed, then packed in a crock or barrel, layers of fish alternating with layers of salt. To prepare the preserved herring, you simply dipped the number you wanted out of the crock or barrel, soaked them overnight to leach out the salt and fried away.

And they were there for the taking. Locals flocked to the Roanoke's branching tributaries, where the herring would surge up small creeks accessible to those without a boat. People using large "bow nets," carefully crafted from juniper boughs, could dip the fish out of waters literally rippling with life. "I've seen 15 or 20 mule carts with herring in them," an elderly fellow named Tom Gardner told Charles Heath, an East Carolina University graduate student studying the fishery. This was in the 1920s and '30s. "Filled up with herrings! Dip them right up and throw them right in the cart. . . . You used to could go up the creek and have you a good landing net [bow net] and you could catch, I mean, you could catch all the damn herring you wanted . . . get you two or three cypress trees together on the bank and stand there, and the herrings would come in there!"

No more. Gone are the old river haul seine fisheries. Gone are the chanteys sung by the fishery workers as they pulled nets from the river. You can still stand with your back to the Cypress Grill and your face to the Roanoke, and look upstream along the far shore and, if you look hard, make out the mouldering remains of a long fish walk on

***The traditional way** to cook herring is to cut slits in each side, then deep fry the fish to the point that practically the entire fish can be eaten—bones and all.*

Leslie Gardner (top) *cleans a pile of fresh herring to be served that day. The fish are prepared by dredging them in cornmeal, then dipping them into hot cooking oil.*

the far side of the river. But that's as close as you'll come to those old days.

"Tiny" Harrison remembers. She's sitting in a window booth with two friends who drove her to the banks of the Roanoke from a nearby rest home. Born just upstream in 1909, she dresses in Sunday-go-to-meeting clothes for her annual pilgrimage to the Cypress Grill. "We stored our fish out in the smokehouse, with tins of lard and sausages hanging off the rafters," she recalls. "To me, it's a real taste of home."

She reminds me that I've yet to sit down and eat. I take a booth across from Tiny, with a view of the river. My plate comes heaped with herring and "Roanoke bacon," tubular sacks of herring roe fried in hot oil till they look like oysters. When I pick up knife and fork, Tiny gives me a quizzical look. "No, no," she admonishes, "with your fingers. One notch at a time."

When in Rome, I figure, and pick up a fish, forked tail between thumb and forefinger. Sheathed in corn meal, the herring is steaming hot, and I have to hold the first few bites between my teeth for a few seconds as they cool down. No one ever mistook river herring for chicken. Fresh from the pan, each bite has a smoky punch, an unrepentant flavor of fish laced with the musk of the breeding migration. I savor each mouthful. I may not know what it feels like to watch net corks bob and dance in the river current, or fill a crock with fish and salt. But for the moment I can taste the brine of the sea, the salt of toil, the urgency of rivers pregnant with spring rains, in the satisfying crunch of a not-quite-cremated herring.

And another, and then another.

Just then Leslie stops by my table, and I ask him about the most herrings he's seen one customer eat. There's one lady, he says, that eats 10 or 12 at a time—"and she's no big girl, either." For years Mort Hurst, a local county commissioner and noted big eater, asked Leslie if he might eat all he could for a fixed cost. "But he's the collard-eatin' king of the world," Leslie tells me, with an I-know-better wink. "Set a world record for eating Moon Pies. We won't let him do it. He'd stick us."

People love their herrings, I say, and Leslie just grins. "Shore do." Like this one fella, he recalls, who came in for supper just before he was scheduled for heart surgery. "He wanted a good fill of herrings before he went in to the hospital," Leslie explains, "and it just so happened that we ran short. He made a horrible ruckus, hollering and yelling. I felt right sorry for him, I did. He told me, 'Mister, if I wasn't in the condition I'm in, I would fight you.' I could see why he needed a heart operation."

Leslie fills my foam cup with iced tea. When I ask him how the food on my plate differs from what was served here 50 years ago, he has to think for a moment. Instead of hog lard, the fish are fried in heart-healthier canola oil, he tells me. And he did pour a concrete floor over the old packed dirt one and install an automatic fish scaler 10 or 12 years ago. "But we've not tried to get real modern," he says, without a trace of apology.

Before I head out the door, I amble over to a far table, where Sally introduces me to Mack and Dona Smith—"some *real* herring eaters," she says. The Smiths are polishing off a half-dozen fish and pondering pie. For the last 10 years, they've made the 45-minute-drive from Washington to the Cypress Grill every Friday night the diner is open. "*Every* Friday night," Mack says proudly, holding a half-eaten herring with two hands. He's a trim fellow in a crisp shirt. He can, in fact, recall the only two Fridays he and Dona missed their appointed hour. In March of 1994, Dona had back surgery and couldn't make the trip. "But we didn't go without; we still ate herrings," he says, with a resolute nod. "It just so happened that the local fire department had a few."

"As long as they're around, we'll eat our share," he tells me, and in his voice I scent the fear of a fishless Friday. "Sometimes we almost get to the point where we want to come in the middle of the week, but we don't. Looking forward to it just makes them better."

That, I figure, and looking back. ⊠

A Blueback Comeback?

In North Carolina's sounds and major coastal rivers, net fishing for alewife and blueback herring (collectively known as river herring) falls under the jurisdiction of the N.C. Division of Marine Fisheries. In most headwater and tributary streams, the N.C. Wildlife Resources Commission has jurisdiction over the harvest of river herring.

Currently, the numbers of river herring returning from the sea each year to spawn in the Albemarle Sound, Chowan River and Roanoke River are a tiny fraction of historical numbers. Restaurants and herring roe canneries now have to look out of state and even out of country for supplies of these once-abundant fish.

The Division of Marine Fisheries classifies the Albemarle Sound river herring population as "overfished," which means herring are being harvested each year faster than they can reproduce. To address this situation, Division of Marine Fisheries biologists collected all available data and in 2000 completed a Fisheries Management Plan designed to restore river herring populations.

Commercial fishermen use hand nets *to dip herring from a pound net full of striped bass on the Chowan River.*

The current allowable commercial harvest of river herring in the Albemarle Sound area is 300,000 pounds. "The fisheries management plan was set up to increase the population," said Kathy Rawls, a biologist with the Division of Marine Fisheries. "The restoration targets are to restore the spawning stock biomass so that it is capable of producing maximum sustainable yield in 24 years time."

The Wildlife Commission also is concerned about the low numbers of river herring. "Young river herring produced in our rivers and sounds are a very important food source for nearly every inland game fish species sought by anglers" said Pete Kornegay, the Wildlife Commission's coastal region fisheries coordinator, "and until the herring populations are rebuilt, a large part of our game-fish diet will be missing. Our recommendation to the Division of Marine Fisheries was to severely curtail the commercial harvest of river herring so that the recovery might occur much sooner."

Currently, river herring taken from waters in coastal streams managed solely by the Wildlife Commission may not be bought or sold. Staff biologists have also recommended to the Wildlife Commission the enactment of a per-person creel limit of 25 river herring.

—*Chris Powell*

STREAMERS *for* SPRINGTIME

Smallies

Simple fly-fishing tactics can create some of the most exciting smallmouth bass fishing of the spring.

WRITTEN BY JEREMY GRADY • PHOTOGRAPHED BY JODY DUGGINS

It was a warm April day, with a few dogwoods on the bank beginning to bloom. The lake was rather calm; a few boats were on it, and a slight breeze was stirring. My brother Jason and I pulled up along the main channel where it met the outer edge of a cove, creating a point. We looked for tree laps in particular. As the boat slowed, we started working some line out with our fly rods. In just a few minutes, I heard Jason saying, "Take it—take it—that's it!" The next sound I heard was a hook set that only a fly rod makes. All Jason could do was hang on as the fish headed deep. It made a steady incline to the surface and leaped completely out of the water, shaking its head violently. After a couple more runs and one leap, it reluctantly came to the net. That fish was 19 inches long and close to 4 pounds—a nice smallmouth anywhere. And caught on a fly, which made it better.

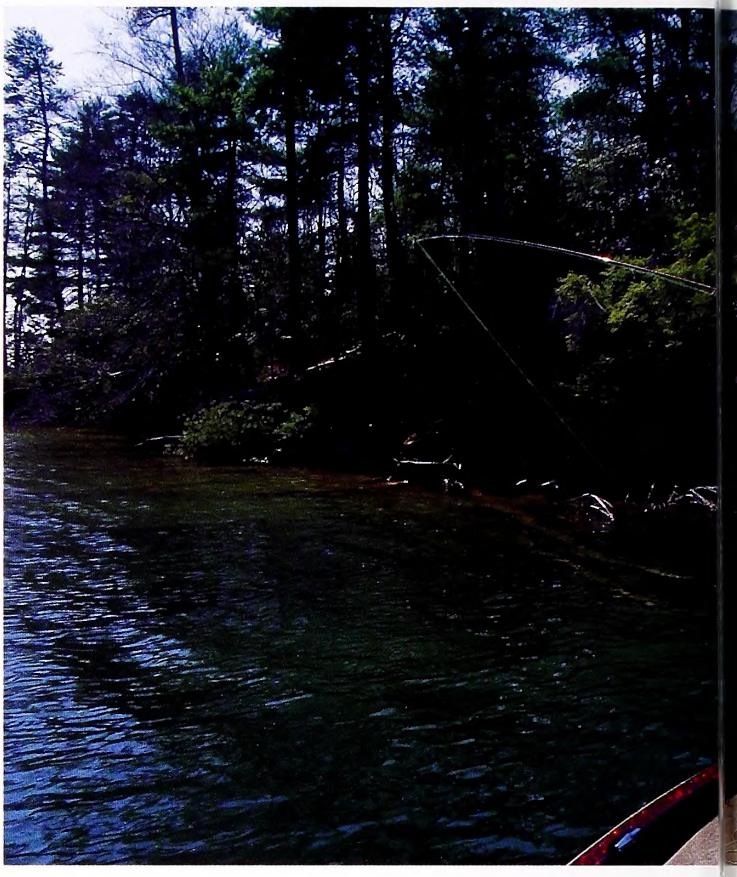
JEREMY GRADY

Fishing western North Carolina's lakes for prespawn smallmouth bass is something I wait for all winter. Early every spring, once the water begins to warm, the fish move up into shallower water to spawn. I don't know what the actual water temperatures are. But I do know this: When the dogwoods are in bloom, the fish are on the banks.

I pay particular attention to the last week in March through the first two weeks in April. We've caught our biggest smallmouths during this period, mostly big, spawning females. We've also caught some 13- to 16-inch males over the same period. As April progresses into May and through a couple weeks in June, we'll catch more 10- to 14-inch fish. Still, any smallmouth 10 inches or longer on a fly rod is a blast.

Smallmouth bass this time of year aren't really in a feeding mode as much as a spawning mode. They're hungry, but not as aggressive as they will be in several weeks. Therefore, you see a lot of bass cruising the banks. Combine this with clear water and their spooky nature, and smallies can be downright difficult to catch. I've used conventional bait-casting or spinning tackle, but the fish don't seem to be interested or aggressive enough for it. Bass anglers have been successful using finesse tactics this time of year. But when the fish still don't bite, consider the fly rod.

For a few weeks in early spring, smallmouth bass move up to the shallows to prepare to spawn, making them excellent targets for an angler with a fly rod.



Where to Fish

Many anglers don't think of using a fly rod for bass fishing in lakes. Some know the joy of bass-bugging for largemouths, but the fly rod offers a whole new dimension for lake smallmouths. Smallmouth bass have long been known to love flies, and flies offer imitations that are totally different from any conventional bass tackle. The flies I use this time of year have subtle, lifelike, helpless or vulnerable actions that sluggish bass find irresistible. I fish them slowly. The flies land softly, which decreases the chance of spooking already-skittish fish.

A great place to start looking for spring smallies is the main channel. Fishing the main channel in the spring can be difficult because of the wind, but we'll catch them there into the summer. Smallmouth bass can be structure-oriented, so look for any kind of debris along the bank. Downed trees, brush piles and rock piles tend to hold bass. Sometimes we'll catch a particularly large bass off one tree alone.

Smallmouths love points, and those off the outer edges of coves into the main channel can be excellent. Secondary points can also be wonderful. Again, if you can find some debris, you could hit a potential hotspot. We've caught fish that were just cruising around points with very little cover. Also, we'll fish a particular point that's a known smallmouth producer, then come back a couple hours later to fish it again. This technique helped us place second in a bass tournament last spring.

Sometimes, we'll venture back into the coves, where we've picked up some nice bass. Coves that are fed by a spring or a creek produce well, as do coves that have a deeper bank with cover. The farther we go back into coves, the more largemouths we see. They're known to eat a fly, too.

How to Fish

I use a simple technique when fly-fishing for these spring smallies. Stand in the boat so you can see deeper in the water. A good pair of polarized sunglasses is critical for spotting cruising bass and for watching the fly sink and the fish take it.

Start by casting the fly to the bank over tree laps about halfway out from the length of the tree. Let it sink several feet. Half the fish we catch take the fly at this moment. I fish the fly just fast enough to keep it from sinking into the brush, which I can see by standing in the boat. If a fish doesn't take the fly, then I strip it over limbs in foot-long jerks. As soon as the fly passes over the limbs, let it sink for several seconds. Bass have been known to come up and nail the fly as it falls.

My brother Jason fishes the fly slightly differently. He casts the fly all the way to the back of the tree and works it over the entire length. He might fish the fly slightly faster than I so he doesn't get hung up. I've seen him land 3- to 4-pound smallmouths that were in water 2 feet deep.

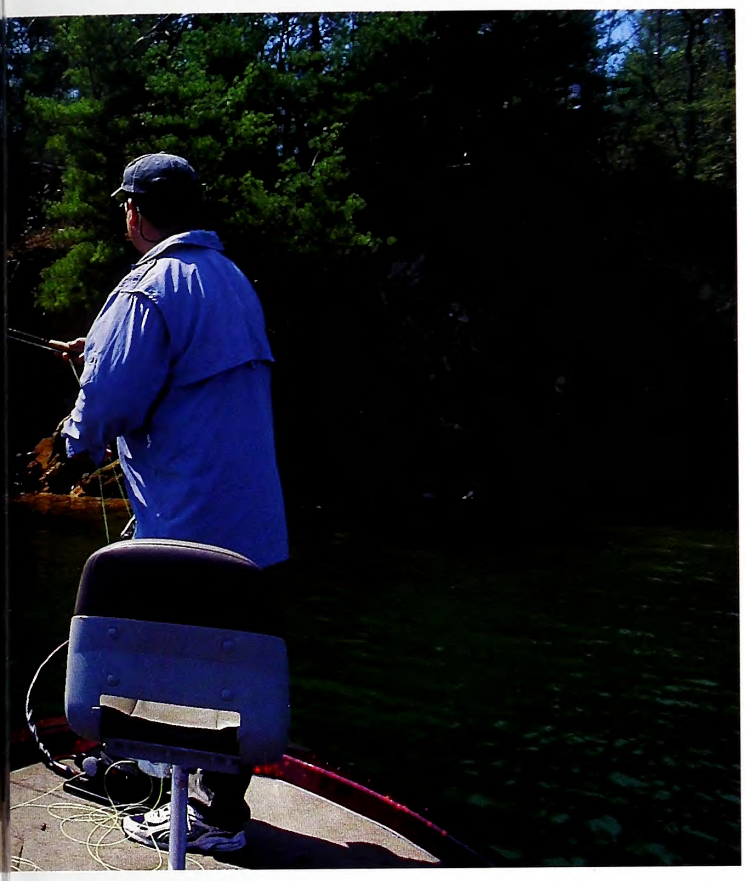
It can be heart-stopping to see a nice smallie come up to eat the fly, but you have to be patient. Often, all they do is inhale it. When you see that fish open its mouth, you'll want to set the hook like the fish is a tarpon. The problem is, if you miss that fish, it probably won't hit again. And if you do connect, you might break the tippet. I try to wait long enough to see the fish at least turn its head. If you can wait that long, you can get a solid hook in the corner of its mouth.

What to Fish

Most of the flies I use are tied with marabou, which gives a lifelike action that fish find irresistible. I also tie them slightly weighted so they'll sink slowly. Woolly buggers are my favorite, and black is hard to beat. I don't know why smallmouths like black so much. Maybe it looks to them like competitive fry or some sort of amphibian or something they've never seen before, but they love it.

Another effective fly is a black marabou leech. This fly offers a bigger image than the woolly bugger. It has four to five clumps of marabou tied on the body. When wet, they produce an incredible fishy-looking appeal. One day last spring, I boated 18-, 17- and 16-inch smallmouths on this fly within one hour. I also use a marabou streamer. This is a simple fly with a silver Mylar body, red throat and a thick white-and-chartreuse wing. When wet, this fly looks like a minnow. It's also easier to see 4 to 5 feet deep.

All these flies are tied on size No. 6 streamer hooks. Size No. 4 is good for largemouths, and size No. 8 is good for slab-



Springtime smallmouth *fishing with a fly rod is a great way to start the fishing season in western North Carolina, and also offers a chance at a trophy bass.*

sized panfish. A No. 6 is perfect for smallmouths. This fly also appeals to walleye, white bass, largemouths and big bluegills.

Another well-known smallmouth producer, especially in rivers, is the Clouser minnow. It's equivalent to a fly-rod bucktail jig. It casts like a bullet, sinks fast and looks like a small minnow. Because this fly sinks fast, it's easy to get hung up, so I end up fishing it faster than the other streamers. I like to fish this pattern on deep banks because it gets down quicker. As the fly falls, I've seen smallmouth come up from nowhere and swallow it. I like the natural brown and white with silver-and-gold crystal flash, size No. 4.

An 8- to 9-foot fly rod with a weight-forward 6- or 7-weight floating fly line will throw the weighted flies with much more ease than lighter rods. It will also keep the flies from whizzing by your ear. A 7- to 8-foot leader tapering to 8-pound test clear monofilament will prevent the leader from breaking, but 8-pound doesn't always hold. Pay particular attention to your leader throughout the fishing day. Smallmouth bass will exploit poorly tied knots, nicks or rough places in the leader.

Keep a close eye on hook points. Smallmouth bass are mean when hooked; they'll jump and try to throw the fly. A sharp hook penetrates better, helping you to hang on longer. And you're going to get hung up in the brush, which helps dull the points. I learned that lesson the hard way. Last spring I was fishing with a friend, and we hooked 14 fish but lost seven that threw the fly when they jumped.

The challenge after hooking a smallmouth is landing it. They're known for hard runs and leaps, and they'll head for cover in an instant. Try to steer them into deeper water, where you have a fighting chance to land them. The fly rod is an excellent tool for leverage.

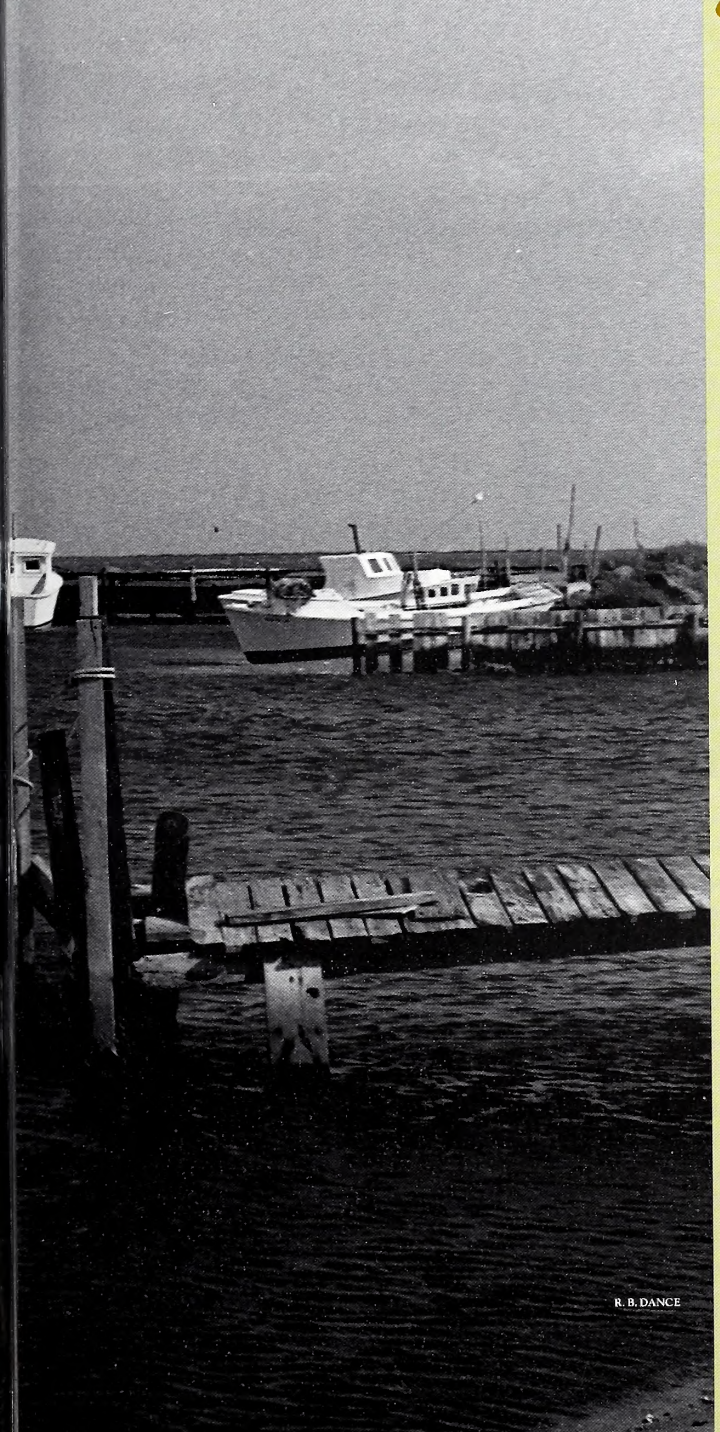
Springtime smallmouth fishing with a fly rod is very exciting and is an excellent way to kick off the fishing season. When you can see the fish and they're not hitting, that can be aggravating. Break out the fly rod and give it a try. You might be surprised when a fish that looks to be close to 5 pounds emerges from nowhere and engulfs your fly. The hook is set, and you're reeling in. Just don't be too shocked when everything erupts and the fish is gone. With your fly. ⊠

One Plank at a Time

written by Rodney Foushee

Efforts are under way to restore one of Core Sound's most important wooden fishing boats and preserve a tradition for future generations.

R. B. DANCE



R. B. DANCE

"**What do you know about the *Jean Dale*?**" I yell above the sounds of circular saws and hammer beats. The September sun is retreating westward toward Beaufort, and the salt-laden air of Core Sound is thick all around. Clarence Willis drives one last nail into a juniper plank and motions for his helpers to knock off for the evening. Tanned island men silently pack up their tools amid the sawdust and lumber and disappear in the fleeting light, leaving me alone with Willis and his son, Junior.

"What you want to know about her?" Willis asks back sheepishly, arms folded, with an old hammer in the crook of one arm and his strong back leaning squarely against the bow of the unfinished wooden skiff. He looks me over with the distrust of a stranger bearing beads for a one-sided trade. I understand his distrust. Here on Harkers Island, I'm considered a "dingbatter," an outsider. And it's folks like me—in Willis' and most other natives' views—who've changed this island, its people and their way of life.

"She is a Core Sound sink netter, right? One of the last of her kind left?" I know enough to ask the right questions.

"She was just another fishing boat—the *Jean Dale*. There was a time when there were 50 or 60 boats like her on this island," Willis responds matter-of-factly. "But there ain't many left anymore." His 71-year-old blue eyes flash back to the past, and I know he knows more. His leathered arms unfold and relax as he continues.

"She was a good sea boat built for Harry Lewis back in the early '40s" Willis explains as he lays down the hammer on a sawhorse. "She was a real fishing boat, maybe 40 foot long. Harry worked her year-round—shrimping and pulling nets," he said. "Sank twice and caught afire once, but they didn't give up on her."

And the *Jean Dale* didn't give up either. The planked boat, built of heart pine and juniper, was fished nearly continuously for 50 years, Willis explained, bringing back loads of shrimp, gray trout, spot and sea mullet to Harkers Island. Once, Harry sank her off Brown's Island in rough seas with a heavy load of jumbo croakers—maybe 120 to 125 boxes full. "It brigged up on him; and with so much weight, the stem went down. But they raised her and got her dry in a day or two and went back at it again."

***Despite her graceful** lines, the* Jean Dale *was constructed strictly as a working boat in the 1940s. Handcrafted of longleaf pine and juniper planks, the sink netter was built to handle the rigors of year-round commercial fishing as evidenced by these photos of the boat in the late 1960s on Harkers Island.*

JODY DUGGINS

Harry Lewis was the sole owner of the *Jean Dale*. And when he got too old to fish her, his grandson took up fishing the boat for a while. "She didn't owe Harry nothing," Willis said. "She had well paid for herself."

"Who built the *Jean Dale?*" I blurt out, guessing that Willis knows much more.

"Brady Lewis built her, along with some other men on the island. And I helped work on the *Jean Dale* when I was young," he explains. "Brady Lewis—well, he's the one that started this (boat-building) mess with the flared bow—'flow'r' we call it, and he taught me too. I quit school when I was 13 and started working for Brady. At first, he would just let me hold the planks. But he got to where he would trust me more to cut the planks."

The *Jean Dale* was indicative of the "Harkers Island boat," Willis explained. She was narrow, long and graceful with a distinctive flared bow—made famous by Brady Lewis—and a low transom and a rounded stern to prevent the fishing nets from hanging up when they were pulled in by hand by a three-man crew. She had a fairly flat bottom for a shallow draft to navigate the waters of Core Sound. But the flared bow, with just enough dead rise, helped cut the waves offshore in heavy seas. "The narrower the boat, the more dead rise," Willis said. "A narrow boat was a better sea boat. But you didn't let her get side-to in rough seas. You took your waves head-on. And the round stern worked good for pulling in the sink nets," he added.

The *Jean Dale* was fitted with a six-cylinder Chrysler gasoline automobile engine and had a 22-inch wheel (propeller), Willis explained. But she could make 18 to 20 knots in good conditions at 3,400 rpm's. And she had a distinctive "doghouse" up front where the captain could pilot her in rough conditions.

Brady Lewis—considered by many the father of North Carolina boat building—is credited on Harkers Island with developing the flared-bow boat. He devised a simple mathematical formula to lay up the narrow juniper planks in various widths in nearly seamless perfection to create the distinctive bow shape. "He just got it in his head, the flow'r," Willis said. "Besides, it makes a prettier boat anyhow."

Before the days of modern fiberglass, Brady Lewis taught Willis and many others on the island how to work out the calculations for the graceful curves of wood. In his nearly 60 years as a boat-builder, Willis has built hundreds of wooden boats, from skiffs all the way up to 70-footers. But he's never touched fiberglass and never will. "Can't stand the stuff. In my opinion, it makes a sorry boat—too easy to bust her with fiberglass. Wood is much stronger. I wouldn't even try to guess at the number of wood boats I've built. I've retired twice from it, but then somebody on the island wants me to build 'em a boat."

That's where this 24-footer he's working on came from. The plans themselves are not written down—each one comes from Willis' head, just like his teacher, Brady Lewis, did it. But too few builders work with wood anymore.

Willis wistfully thinks back. "I wish it was back like it was 20 years ago. There's too few working in the fishing now, and wood and materials are too expensive. There's still some juniper left, but no heart pine. And everybody wants fiberglass now. Used to be people made boats for people who used boats to work and earn a livin'. Then the big people—the moneymen—got into it with fiberglass. Naturally, the dingbatters came in too. They put the damper on us and wooden boat-building."

History of the Core Sounder

Built as a commercial workboat, the clean lines of the *Jean Dale*, with its flared bow and rounded stern, represent a pinnacle in North Carolina boat building, explains Mike Alford, former curator of maritime history at the North Carolina Maritime Museum. And the lasting popularity of the flared bow made famous by the wooden boat-builders on Harkers Island and Core Sound has spread up and down the East Coast and is still found in an exaggerated form in the modern fiberglass fishing boats of today.

The Core Sounders, as this class of boat was called, once dotted the small harbors of Harkers Island and nearby coastal communities. Sleek and gleaming white, they had a low, graceful sheer that swept up to a smart, flared bow, while the aft end terminated in a low, almost dainty round stern, Alford explained. There was a simple low cabin forward that sheltered a galley, a couple of berths for the crew and a bad-weather steering station. Directly over the station a hatchlike windowed box allowed the helmsman to poke his head up and look around. Built on the island, and in a few nearby mainland communities, they ranged in length from around 35 feet to more than 40 and were powered by single engines.

"In the building of boats, there is a general maxim that changes occur slowly and only when necessary," Alford said. "Probably nothing ever overhauled the boat builder's status quo more significantly, or as rapidly, as did the advent of the internal combustion engine."

The story of the Core Sounder began when the fishing community began to accept gasoline engine power as a viable alternative to sail. In North Carolina that was near the end of the first decade in the 20th century. Three decades later, the Core Sounder emerged. Although elements of its design and construction can be traced back to sailing craft, the Core Sounder represents what might be considered the perfection of a power-driven hull, explains Alford, not as the end result of a series of modifications to sailing hulls.

Boat-building has always been a major interest in North Carolina since its earliest days as a colony. Prior to the Civil War, boats built with logs were the rule. Following the war, two boat types dominated inshore fishery and commercial activities in the state. The round-bottom shad boat, with its versatile sprit-main and jib rig, prevailed in the northern sounds—the Albemarle, Pamlico and Croatan. Core Sound, to the south, was the stronghold of the sharpie—a flat-bottomed immigrant from Connecticut. By the late 1800s, sharpies were found as far south as Wilmington and Southport, and as far north as the sounds extended. But Core Sound was their stronghold.

By the early 1930s, with powered boats everywhere, the new challenge was a demand for "bigger and better" boats that could navigate the shoal sounds, contend with summer squalls and venture into deep-sea fishing grounds. Enter the Core Sounders.

Brady Lewis and those who learned from him began producing the first of the Core Sounders in the 1930s. Earlier versions were typically built on a 4-to-1 ratio of

JODY DUGGINS

JODY DUGGINS

Famed boat-builder *Brady Lewis crafted the* Jean Dale, *with the help of others on Harkers Island including Clarence Willis (above and facing page), who was a teen-ager at the time. Now in his 70s, Willis is working with others on the island including Jimmy Amspacher (top) and Heber Guthrie (not shown) to restore the historic fishing boat.*

length-to-beam, and were powered by engines of 115 horsepower or less. Just before World War II and immediately after, boats experienced a trend that saw horsepower double in a short time, and length-to-beam ratios began a downward trend toward 3-to-1.

The *Jean Dale* represents the best of the postwar boats, Alford said. She is simple and clean, and has all the features in the appropriate proportions that give the Core Sounders their distinctive look: low freeboard, saucy bow flare and a graceful round stern. By the early '50s, the use of larger and faster engines resulted in less graceful proportions. Deeper and more robust, the round stern was no longer the sweetly balanced end of a sleek, easily driven hull. At the same time the flared bow sections grew more and more extreme. But the *Jean Dale* had the grace and charm that well-balanced elements of design give to a boat.

Restoring the *Jean Dale*

Noted North Carolina maritime artist Bob Dance remembers his first encounter with the *Jean Dale*: "It was in the late '60s, and my family used to vacation at Morehead City," Dance explains. "I would explore the whole area looking for subject matters to paint. On Harkers Island one day, I saw the *Jean Dale* for the first time at the very end of the island. It was the first Core Sound sink netter I had ever seen. I regard it as one of the three or four classic North Carolina boats."

Dance also witnessed the decline of wooden boat-building. "I noticed that the tradition was tapering off on Harkers Island. The younger people were moving away. That tradition has to be passed down from father to son or a good friend. These boats were no longer being built on the island. I decided to start photographing and painting the *Jean Dale* because the boat was so beautiful. I've always thought that something that looks good works well—form follows function. Things that look lousy usually don't work too well," Dance said. "Take that boat from 'The Perfect Storm.' That was an ugly boat, and it turned over at sea!"

Dance has featured the *Jean Dale* in many of his paintings over the years. "I have painted that boat well over a dozen times—maybe 20 or 25 times—in a variety of settings," he said. "I would come back every summer to photograph and paint the boat. Through all those years, you regard something you are familiar with as a friend."

JODY DUGGINS

***With her distinctive** flared bow (above), the* Jean Dale *is indicative of the "Harkers Island boat." Artist Bob Dance (right) was so enchanted with the* Jean Dale *that he has featured the boat in many paintings.*

Like a faithful friend, the *Jean Dale* continued to ply the waters of Core Sound until the late 1990s, when Harry Lewis' health began to fail. The boat that came to represent so much of the region's boat-building tradition ended up docked and decaying at a Harkers Island harbor. After Lewis' death his family donated the *Jean Dale* to the Core Sound Waterfowl Museum in September 2000 for restoration and to preserve island traditions. But the aged boat badly needs repair. Besides suffering from weathering, its basic design had been altered: The doghouse up front had been removed, and a modern cabin had been built, changing the traditional lines of the boat.

That's when Dance came up with an idea to help raise funds for the restoration. "When I saw that it had been donated to the museum, I thought I should try to do something to help raise the money for the restoration of the boat," he said. "It looks like it needs a lot of work. A lot of people, besides me, are donating their time to this project."

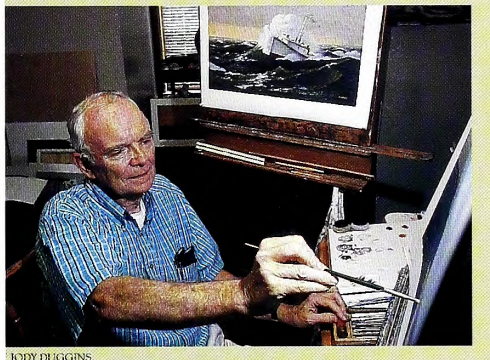
In what has ubiquitously been named the "*Jean Dale* Project," Dance decided to paint an original painting of the *Jean Dale* and sell limited-edition prints with the profits going to the museum for the restoration. Others in the community have chipped in.

Workers from Jarrett Bay and East Bay boatworks used heavy equipment to lift the *Jean Dale* and haul the boat to the museum. And an anonymous donor provided money for a concrete pad and framework to keep the boat in dry dock. Clarence Willis, along with other locals, is helping to restore the *Jean Dale*—providing labor and a lifetime of knowledge of a boat he helped build.

It's going to be a costly undertaking—requiring $60,000 just to build a roof to protect the aging boat from the elements, especially rainwater, which is the bane of any wooden boat. "She's failing fast," Clarence Willis explains. "It's going to take a lot to bring her back to the way she was."

But if anyone can do it, the people of Harkers Island can. ⊠

R. B. DANCE



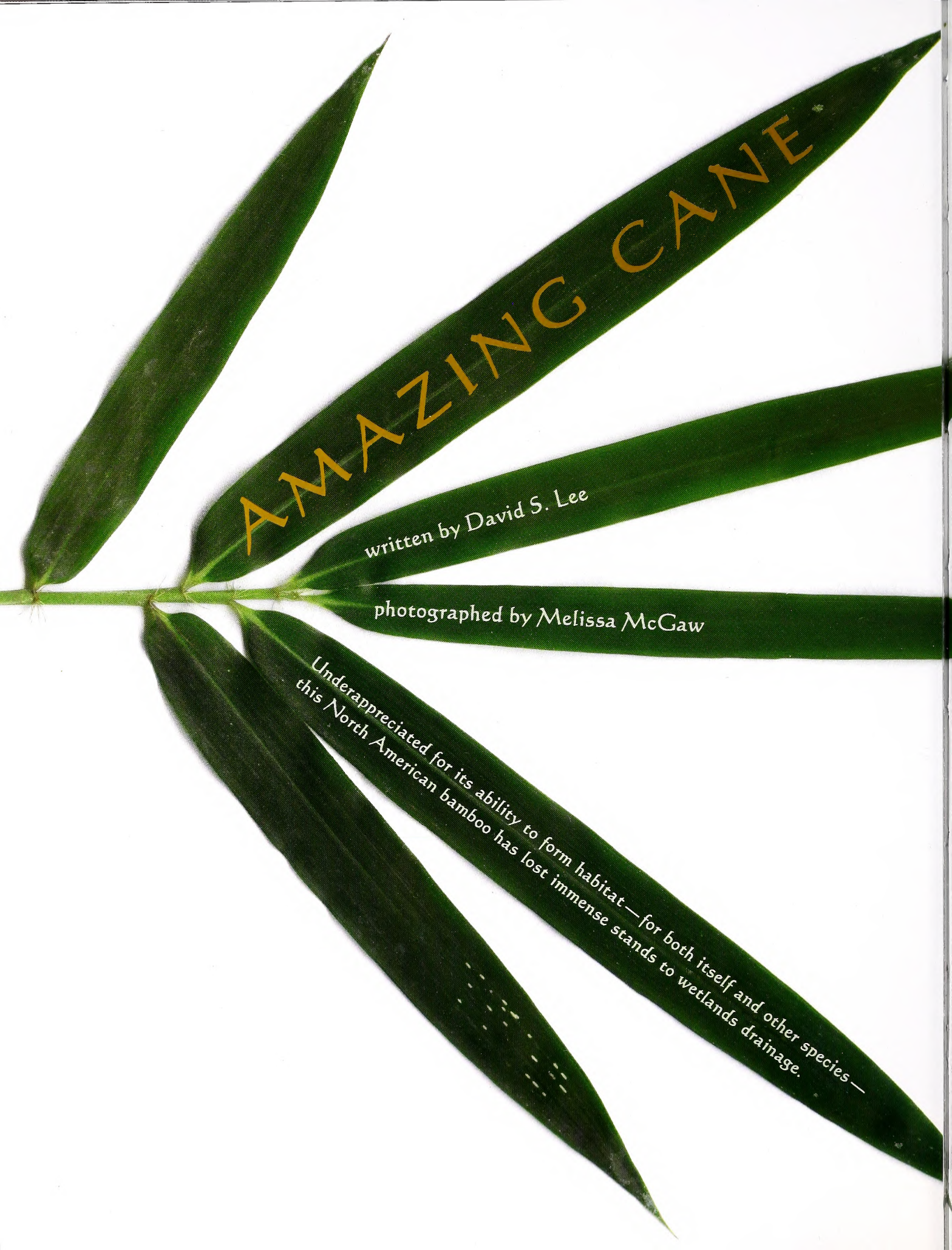
JODY DUGGINS

R. B. DANCE

Prints for Planks

The restoration of the *Jean Dale* is a major financial undertaking for the Core Sound Waterfowl Museum, explains museum director Karen Amspacher. "We've consulted with the Smithsonian and the North Carolina Maritime Museum on methods for restoring the boat," she said. "Our main goal is to restore the *Jean Dale* for nomination as a historic vessel to the National Register of Historic Places." That means replacing rotted planks and restoring the pilothouse to its original configuration —no minor feats considering the cost of labor and wood. The museum also wants to build a roof to protect the boat from the elements, and there are plans to eventually have exhibits and a teaching area to share the legacy of boat building with the public.

To raise funds for the $100,000 restoration project, the Core Sound Museum has teamed up with artist Bob Dance to offer a special reproduction of his painting The *Jean Dale* (above). Proceeds from these limited edition prints will go to the boat's restoration. Signed and numbered prints sell for $150. For more information or to order a print, call the museum at (252) 728-1500. To see the *Jean Dale* as she undergoes renovation, visit the Core Sound Waterfowl Museum on Harkers Island. For more information, visit www.coresound.com.



AMAZING CANE

written by David S. Lee

photographed by Melissa McGaw

Underappreciated for its ability to form habitat—for both itself and other species—this North American bamboo has lost immense stands to wetlands drainage.

Cane (*Arundinaria gigantea*) is the only species of bamboo native to North America. Like other bamboos, the cane's stems have a jointed, woody appearance. Bamboos are the most primitive of the grasses, based on limited differences between the vegetative and flowering parts of the plant.

This bamboo's genus name is derived from *arundo*, Latin for "reed," and there are a number of related Asian species in genus *Arundinaria*. The species name *gigantea* refers to the plant's height. Left undisturbed, individual cane stalks may grow 15 to 25 feet tall. Botanists recognize two forms of cane, which were once considered separate species. Most grass experts no longer separate the two forms. It is clear that this is another of many organisms for which our concepts of speciation fail to fit the reality of variation.

In North Carolina, both forms grow throughout the state, but their overall ranges in the Southeast are not identical. The two differ in size, and the smaller of the two—once given the distinct species name *tecta*—flowers more frequently. It can grow on drier soils. This smaller variety produces distinct flowering shoots that arise from its dense underground roots, or rhizomes. The larger cane has its flowers coming directly off the cane stalks.

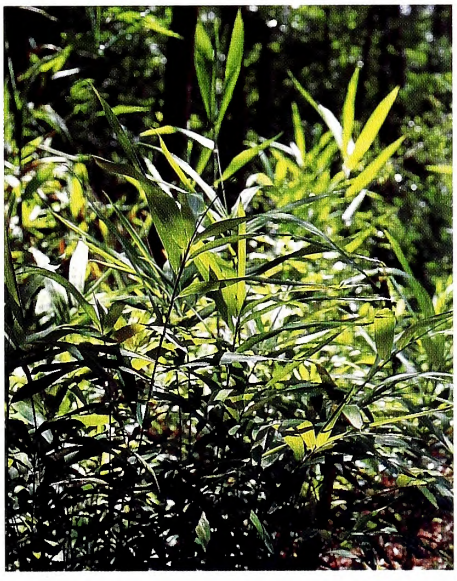
Cane, at least the tall form, has a genetically controlled life expectancy. After about 15 years, the stalks flower for the first time and die. The underground stems also die. If the plants are clones—that is, they all developed at the same time—then all the flowering occurs simultaneously, and cane suddenly disappears from large areas. But the seeds left behind soon sprout, and the cane thicket looks the same after only a few years.

The same laws of determinate age also govern the flowering and dying back of the larger, treelike bamboos of Asia. Some species take decades between flowering, and the people of a bamboo-rich region often mark time and age by the flowering cycles of particular indigenous species. Instead of stating age in years, someone may say, "She has seen the bamboo flower three times."

RICH IN CANE

To see how a seemingly unimportant and less-than-glamorous species can have far-reaching impacts on entire ecosystems and regional economies, look no further than cane. It is a characteristic plant of pocosins, Carolina bays, alluvial stream terraces and the higher portions of southern river swamps. Cane grows abundantly in wetland soils of North Carolina, and dense continuous stands are often referred to as canebrakes.

Canebrakes were once a conspicuous component of southeastern North America's landscape. At the time of European contact, canebrakes covered hundreds of thousands of acres. Descriptions of "vast tracts" of cane and stands "many miles in extent" can be found in the literature of the period. In the late 1700s, a single southeastern canebrake was estimated to have covered an area of more than 800,000 acres. Today, while cane is still a common species in many wetland sites, it is seldom dominant. And many of the wetlands that once supported cane stands have been drained.



Cane ranges throughout the Southeast, as far north as southern Maryland and southern Ohio. Under the right conditions, like other bamboo, it can be an aggressive grass. Its rapid growth and ability to regenerate, as well as its evergreen nature, have made cane economically important as a forage crop for livestock. Up through the 1950s, the North Carolina Department of Agriculture distributed a number of pamphlets on the value and management of cane.

Of even greater importance is cane's key role in the creation of peat deposits in the southeastern Coastal Plain. Over time, cane actually improves its own habitat, building up the soil above saturated areas to create the moist conditions where it thrives. Radiocarbon dating has shown that many of today's peat formations are less than 3,500 years old. Where cane is abundant, peat can accumulate up to 1 millimeter per year.

One of the many benefits of intact cane-produced peatlands is retention of water, nutrients and suspended materials. The wet soil allows wetland plant communities and their associated fauna to persist even through prolonged droughts. The ability of the peat to retain water extends the hydroperiod of the soil. Prolonging the period of time soils remain damp influences what plants can grow there. Peat soils also improve habitat for aquatic species. Like a sponge, peat soaks up stormwater runoff, filtering pollutants out of the water cycle. The sponge action also reduces the surge of fresh water into estuaries, protecting habitat for shellfish and other commercial estuarine species downstream.

The ability of peat to retain moisture and change the soil acidity has horticultural implications, which many gardeners have grasped over the years. Small amounts of the state's peat resources have been sold for horticultural use, but most peat purchased by gardeners comes from Canada.

Because cane is an important peat builder in southern wetlands, it is actually responsible for the tangled evergreen thickets where this bamboo best thrives—pocosins. In acidic peat soils, well-established

cane thickets can hold their own against many wetland plants, even encroaching on them through root competition. In dense cane stands, the underground stems, or rhizomes, become a tangled mass. Walking through pocosins, you notice the ground often becomes drier than in surrounding vegetative types. This is because the underground cane rhizomes interlock, building a mat slightly higher than the saturated soils. This plant thrives in wetland soil, not doing well in places regularly flooded and dying out in areas where the soils become dry.

The result of peat production is good soil for cane, but poor soil for other plant species. Our Coastal Plain acidic peat deposits are usually thick enough to keep plant roots from reaching the underlying mineral soils. But cane enjoys the benefits of another, more powerful policing agent to remove competitive vegetation.

BLAZING CANE

Cane is a fire-dependent species that also acts as a fire accelerator. With the help of high winds, fire can leap 40 feet into the air as the cane stalks crackle and explode. The sound can equal that of a battlefield. The heat is tremendous, the smoke is thick, and the fire burns hot and fast, often evaporating water from ditches and igniting pines and other trees growing in the same wetlands. The rhizomes, which run deep into the mucky soils, usually survive. New cane shoots can emerge within days after a fire. The cane quickly spreads into adjacent burned areas.

In intense fires, the peat soils themselves burn. Where the rhizomes of the cane and the roots of other wetland plants are killed back, Atlantic white cedar often becomes dominant. A continuous, even-age forest of white cedar indicates a site where the soils have burned, killing off wetland plants and allowing the cedars to germinate on the exposed peat. With the decline of canebrakes, and truly hot fires in wetland systems, large stands of Atlantic white cedar are becoming uncommon.

Pond pine is another tree directly benefiting from cane. These pines do well in the acidic peat beds the cane helps produce, and they are also fire-dependent and fire-resistant. The bark of pond pine is essentially immune to hot ground fires. Small resin wells on the trunk explode when they get too hot, extinguishing fire on the tree's trunk. Fire is a requirement for reproduction in pond pine. Seeds remain locked in cones for years, with the heat of ground fires causing the cones to open slowly. The fire is long past by the time the seeds are released. Thick cane growth under the pond pine assures that fires burn hot and fast, maximizing seed release.

Because peat burns, our state's Coastal Plain peat deposits have generated interest as an alternate energy source. Yet, while an assessment of 560 million tons of moisture-free peat on more than 600,000 acres of land in North Carolina sounds impressive, it would meet our state's energy needs for only about eight years. And this estimate was based on mid-1970s energy use. Furthermore, both peat mining and the conversion of peat to energy raise logistical problems and a number of environmental issues as well. To date, no permits have been issued for energy-based peat mining.

Much of our peatland loss in North Carolina is not from mining but from land drainage. The organic materials in peat decompose once exposed to dry air.

CANE HABITAT

Bamboo specialists, or species that are totally dependent on bamboo forests for their existence, are common in South America, southeastern Asia and several other regions of the world where bamboos grow larger and are a more prevalent part of the landscape. The best known of these species, of course, is the giant panda, which feeds almost exclusively on bamboo shoots. In addition to a number of birds, mammals and amphibians restricted to bamboo habitats, there are frogs, bats, insects and other invertebrates that actually live within the hollow chambers of the bamboo stalks. In some bamboo, the woody chambers are filled with water, supporting unique aquatic invertebrates.

In North America, known bamboo specialists are limited to six species of butterflies—southern pearly eye, creole pearly eye, southern swamp skipper, cobweb little skipper, yellow little skipper and cane little skipper. There is some speculation that the now-extinct Bachman's warbler was habitat-dependent on canebrakes, but there is no evidence to support this. A number of species thrive in cane-dominated habitats, such as the aptly named canecutter, an alternate name for the swamp rabbit, and the canebrake rattlesnake. The canecutter confines itself to cane communities in the northern portions of the Mississippi drainage. The canebrake rattlesnake is now regarded as a southern race of the widespread timber rattlesnake. Swainson's warblers, another species indigenous to the Southeast, are widely cited as being cane specialists. But for the most part they, like cane, are responding to canopy gaps in the forest caused by storms or logging. They are not dependent on the cane *per se*.

In the early 1980s, my wife and I conducted extensive surveys on birds and mammals associated with Carolina bays, pocosins, streamhead forests and other North Carolina Coastal Plain wetlands that often supported rich growths of cane. In more than 200 days of fieldwork, we set and checked 17,000 small

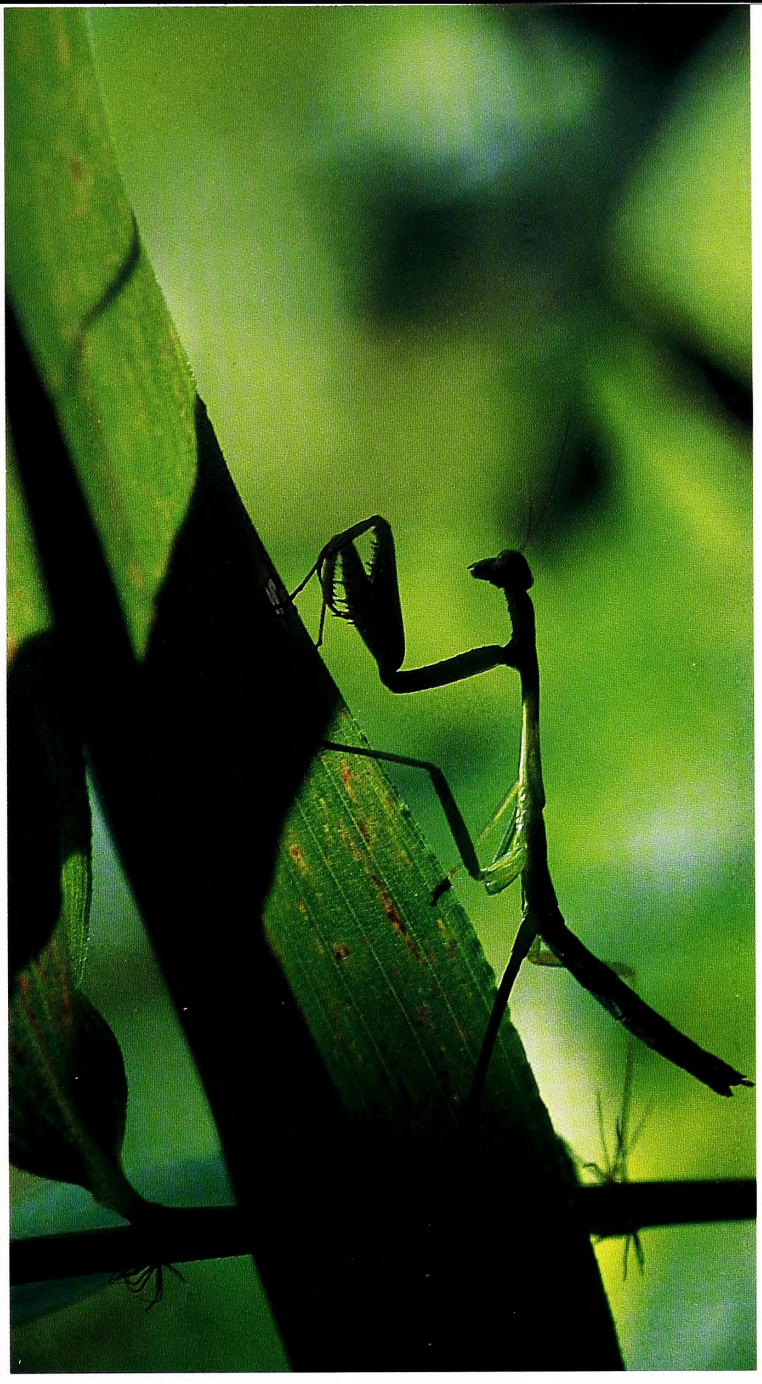
***Cane's entangled** roots, or rhizomes, help form the spongy peat soil in which the plant thrives.*

mammal traps, set mist nets to catch bats and conducted surveys for signs and evidence of larger mammals.

We documented 40 species of mammals using these habitats. At least eight used cane-associated wetlands to the extent that they considerably extended their northern or southward distributions within these habitats only. Others increased their numbers, benefiting from the same fires and clearings made by wind damage, which encourages cane growth. In pure stands of cane and pond pine, we found limited diversity of mammals. But one species, the golden mouse, existed here in densities 10 times greater than in any other habitat we studied. Several hundred hours of surveys for breeding birds in these same communities yielded 40 to 50 species per subcommunity type for cane-associated habitats and 16 to 38 species for wetland communities that did not support cane.

Though this would lead to a conclusion that cane is important for all sorts of wildlife, this is not really the case. The diverse bird and mammal assemblages responded to rich wetland soils and the plant communities they support. And cane, like some of the birds and mammals, received additional benefit from fire and other factors that caused openings in the forested wetlands. Thus, cane was simply a part of these particular plant communities. At the same time, however, it was the agent responsible for them because of peat building, necessary protracted soil-water retention and the fuel it provided for fires. Such an indirect relationship is actually ecologically stronger than a direct one.

WAYNE IRVIN



***Countless wildlife** species rely on cane-formed wetlands habitat—from the aptly named canebrake rattlesnake to the Chinese mantid to the Swainson's warbler. As wetlands are drained, and cane-dominant ecosystems decline, these animals lose critical habitat.*

RAZING CANE

Indian nations used fire for clearing land for agriculture, hunting and warfare. This was a benefit to cane, and vast stands developed that were fire-managed by the Native Americans. They burned the canebrakes once every seven to 10 years, maintaining and expanding the cane by eliminating competing vegetation. Within a few decades of the arrival of Europeans and the introduction of Old World diseases, the Native American population collapsed to 10 percent of its former level. The crash of the native human population resulted in a corresponding decline in agriculture and the regeneration of the abandoned fields. Much of this agriculture was corn grown along river floodplains. Historic accounts of the abandoned agriculture lands of Native Americans describe them as being reclaimed by cane. In the mid-1700s, when explorers began to map the interior of the continent, much of what they found was not pristine wilderness but a 200-year-old, second-growth forest supported by a landscape that had been heavily modified.

The decline of vast canebrakes was well under way by the 1700s and continued to proceed rapidly. Existing canebrakes were gradually destroyed by the overgrazing of domestic animals, new burning schedules, European-style agriculture, land draining and major flood-control projects in bottomlands. Prior to the invention of chemical fertilizers, the very bottomlands that supported cane were prime agricultural lands because of the moist, nutrient-rich alluvial soils. Farmers burned the land in late winter and early spring, killing the new growth of cane. The few remaining rhizomes that resprouted were removed by hand. The surviving canebrakes were excellent native grass pastures because of their evergreen foliage. Partly because of this, the frontier of the South became a major livestock-producing region. By 1860 more than 12 million cattle and an even larger number of hogs were supported by open-range grazing. These large herds were not compatible with the cane. To generate new cane growth, frontier farmers burned the ranges annually. The overgrazing resulted in the conversion of canebrakes to savannahs supporting other species of grasses.

Once eliminated, cane is slow to recover. Except for its single blooming effort every 15 years, it does not propagate from seed, but through vegetative spreading of the underground rhizomes. By the early 1900s, canebrakes had all but disappeared. A few remained in isolated areas well into the 20th century.

author David S. Lee

Cane is still common, and rhizomes supporting a few stalks can be found in most undisturbed wetlands. Where sunlight can reach the soil—along road cuts and power line rights of way—cane flourishes, responding quickly to openings in the forest canopy. Several years back, a misdirected flood control program run by the federal Soil Conservation Service paid to have woody vegetation removed from the creeks that wind through the pocosins and streamhead forest on my property. This was not something I wanted to have done to my property, but a team of

Canebrake inhabitants, such as the spotted turtle (left), are plentiful. But few North American species are dependent on cane to the point that they can't live anywhere else. One is the Creole pearly eye butterfly (caterpillar, right).

government workers had cleared much of the stream edges before I discovered what they were doing. This resulted in increased light levels along the streams. Within a year, a forest of cane stalks emerged from rhizomes that had previously been dormant and from ones that sprouted only a few random stalks. It's now harder to walk along the creeks, but the dense cane stalks at least add a high degree of concealment for the spotted turtles, cottonmouths and canebrake rattlesnakes that patrol the stream edges.

The historical use of land in the Southeast has resulted in a situation where the plant itself is common. But canebrakes as plant communities, and the white cedar stands that often follow, have all but disappeared from the landscape. A number of biologists and wetland conservationists are concerned and calling for programs to restore these habitats. This might be an unjustified reaction.

Were the canebrakes only a result of man-made disturbance in the first place? The fact that they were maintained by Native Americans is moot, in that these people were present on the continent for only about 11,000 years. The suggestion that this is a man-made—and thereby artificial—community type is supported by the limited number of species that seem to prefer it. Consider this when comparing North American canebreaks to those in other regions of the world: Those in North America shelter no real obligate species, ones that cannot exist without the presence of dense, continuous stands of cane. The butterflies dependent on cane are not extraordinary; most butterflies have caterpillars that are dependent on some specific food plants. The other species associated with cane are simply coinhabitants, with cane, of bottomlands. Several of these species, like cane, respond positively to natural or man-induced clearings in the forest.

The interrelationships of cane and cane communities are very peculiar—and less than straightforward. Although it is clear that cane is an important element in the long-term building of acidic soils that allow for protracted hydroperiods, and as a fuel for fires that control community structure, it is not necessary to have vast stands of cane to accomplish either. No native species are dependent on vast tracts of cane, and canebrakes developed historically simply as a result of man's use of wetlands. Yet the very wetland communities in which cane and other wetland species thrive are built in the self-serving environment that this bamboo helps create.

Cane, like cypress and Spanish moss, is characteristic of the Southeast. Although it grows elsewhere in North America, only here in the South does it become a conspicuous species. Last summer I encountered a large canebrake rattlesnake crossing a road that winds through our property. It was right at the place where a creek runs under the road and where the cane now grows lush and tall. This is the same little creek bottom that has supported a pair of nesting Swainson's warblers for the last four years. The snake was fat with her unborn vipers. We exchanged stares for a few minutes, and then she continued across the road and disappeared into the bamboo. I followed for a few steps, but the snake's cryptic pattern, the broken light, and the dried cane stems and leaves made her invisible. I stomped about a bit hoping I could get her to rattle but had no luck. My movements startled a Creole pearly eye that had been resting on the shaded side of a red maple. I was impressed with its speed as I watched the small brown butterfly, nondescript except for its conspicuous eye-spotted wings, fly quickly out of sight. I was also impressed, and somewhat embarrassed, by the fact that I was squandering time watching butterflies.

Still, that particular section of the property instantly became a little more precious than it was just the day before. And although the snakes, butterflies and birds are what grab my attention and interest, the cane itself is the real biological marvel. Its rhizomes, like an unseen deity, were literally supporting and holding together a wetland community that it had helped create. The resulting deep peat deposits with their acidic soils and extended watery periods arrested the growth of competitive vegetation. Fires fueled by the dry leaves and aerial stems of the bamboo kept the few other species that could grow here in check. The pocosin community growing along our creek is as perennial as the grass that glues it together. ◻

Waterways and wetlands are more than just water and soil. They include

Riparian Zones and Buffers

ri·par·i·an (rə-pair-ē-ən) *adj.*

written by Jeff Beane

WHAT ARE THEY?

Under natural conditions, all waterways, from tiny streams to major rivers, have strips of trees, shrubs, grasses and other vegetation growing along their **floodplains.** These vegetated areas, known as **riparian** zones, serve as natural **buffers**, protecting both the streams and the **terrestrial** habitat surrounding them.

WHY ARE THEY IMPORTANT?

Filters – Riparian zones serve as natural filters, protecting streams from **sedimentation** and **nonpoint source pollution**. The roots of trees and other vegetation, and the leaf litter they produce, trap soil sediment before it can enter the stream and suffocate fish, mollusks or other aquatic life. Harmful substances such as pesticides or heavy nutrient loads from fertilizers are also trapped, broken down and used by plants or other organisms before they can poison the stream.

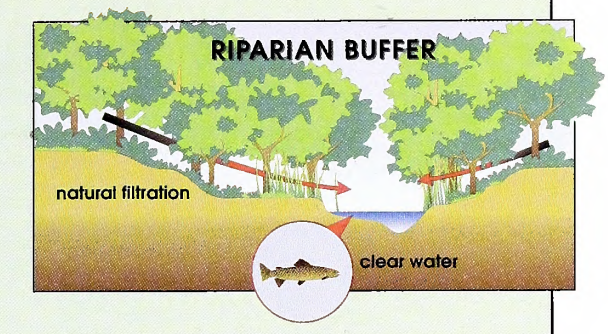
Stabilizers – The root systems of plants growing in riparian areas help strengthen and stabilize stream banks. The vegetation also helps modify the stream's channel and control the rate that water flows through it. This helps prevent **soil erosion**, improving not only water quality, but also the quality (and economic value) of the surrounding land.

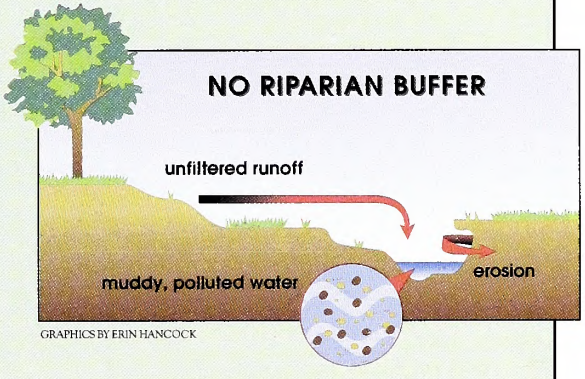
Flood Control and Water Storage – Riparian buffers are like sponges. The plants and their root systems hold and soak up water during heavy rains. This increases the soil's water-holding capacity. The stored water is released slowly rather than rushing directly into the stream, thus helping to conserve **groundwater** and prevent flooding.

Coolers – The shade created by tree and shrub canopies along streams can significantly lower water temperature. Cooler water has more oxygen, vital for coldwater species such as trout. Canopy cover also reduces the amount of light reaching the water, thus helping to prevent excessive growth of algae.

Wildlife Habitat – Riparian zones support a high diversity of wildlife and serve as vital **corridors** and migration routes for many species. Some species, such as mink, kingfishers and cricket frogs, may spend most or all of their lives in riparian areas. Insects and fruit that fall from trees along streams provide food for fish and other wildlife. Leaves, wood and other plant debris that falls into streams or along stream banks provide essential cover for many animals.

Bonus Benefits – In addition to all their practical values, riparian areas provide humans with other benefits. They offer excellent opportunities for recreational activities such as fishing, hunting, canoeing, hiking, wildlife watching and picnicking. The beauty, serenity and diversity of life in riparian areas and other greenways may be more important to our mental health and well-being than we realize.





GRAPHICS BY ERIN HANCOCK

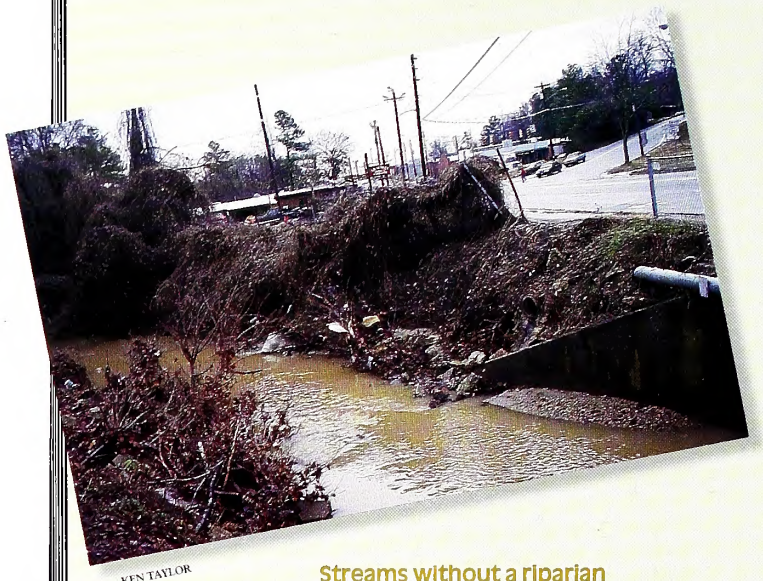
Healthy Waters, Healthy Wildlife

Rivers and streams are cleaner when grass, trees and other plants grow along the banks (upper right). After a rainstorm, water flows across the ground. Known as "runoff," this water picks up pollutants such as motor oil, fertilizer, even dirt. As the runoff flows toward ditches, streams and ponds, the riparian plants slow the runoff, then filter out the pollutants. Buffers also prevent erosion of the banks. The cleaner water benefits all wildlife, especially the species that live in or beside it—birds, invertebrates, amphibians, fish and mammals.

river otter

sunfish

salamander



KEN TAYLOR

Streams without a riparian buffer are frequently muddy and polluted.

What Does It Mean?

floodplains: the low-lying areas stretching along rivers or streams where annual or periodic flooding occurs

riparian: along, adjacent to, or associated with a river or stream

buffers: things that serve to protect or stabilize, as the protective strips of vegetation bordering wetlands

terrestrial: on or associated with land

sedimentation: the depositing of soil or other matter into a stream by water or wind

nonpoint source pollution: potentially harmful substances such as fertilizers, pesticides, herbicides or sediment, which enter streams in runoff from many different sources that are difficult to pinpoint, rather than from a single, identifiable source

soil erosion: loss or wearing away of soil, usually due to water or wind

groundwater: water stored underground in soil or porous rock layers

corridors: connectors; areas that animals can use to travel safely from one patch of habitat to another

ephemeral: temporary; holding water only part of the time

Carolina bays: oval-shaped depressions of controversial origin, found mostly in the Coastal Plain of the Carolinas

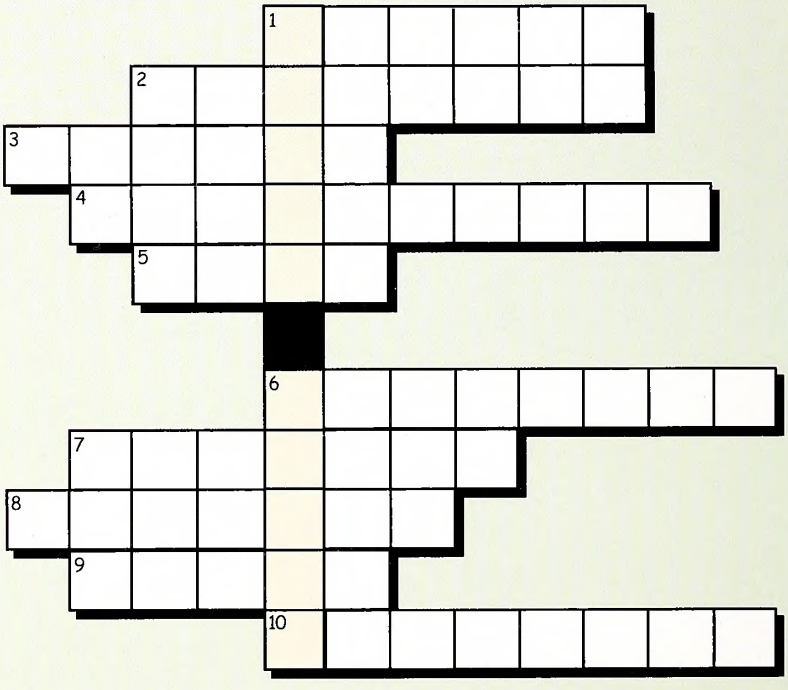
OTHER WETLAND BUFFERS

Swamps, marshes and landlocked bodies of water such as ponds and lakes, also have buffer zones that are vital to their health. Protective buffers around **ephemeral** wetlands such as woodland pools and **Carolina bays** can be especially important. The actual buffers for these sites may extend much farther than they appear to. Many animals—including spotted and tiger salamanders, wood and gopher frogs, and mud and chicken turtles—use wetlands only for breeding, or otherwise live in them only part of the year, spending the rest of their time in upland habitats, sometimes as far as a mile away. Protecting a temporary wetland while failing to protect an adequate terrestrial buffer will also fail to protect many of the creatures that live there..

The Streamside Scrambler

Unscramble the words below and write them in the grid to spell out the mystery word.

1. AYPOCN
2. FIDWLIEL
3. RFEBFU
4. DNAMLSRAEA
5. OEZN
6. TLSENWDA
7. UCATQIA
8. BTAIHTA
9. TEOTR
10. AIPRNIRA



ANSWERS: 1. CANOPY 2. WILDLIFE 3. BUFFER 4. SALAMANDER 5. ZONE 6. WETLANDS 7. AQUATIC 8. HABITAT 9. OTTER 10. RIPARIAN

Get Outside

Identify the riparian zone of a river or stream. How far does it reach? What kinds of plants grow there? Are they different from those found farther away from the water? What wildlife species do you think might use the riparian area or live there permanently? Is the water level high or low? Can you see where the high-water mark might be during a flood? Does the water look clear or cloudy? Can you see signs of soil erosion along the stream's banks? Do you think this is a healthy river or stream system?

Take a close look at a pond, lake or woodland pool. Does it have a buffer zone around it? Can you see evidence of soil erosion or sedimentation? Would you expect to find more kinds of animals living in and around a pond surrounded by woodland, or one surrounded by a pasture or golf course?

The North Carolina Museum of Natural Sciences in Raleigh and the North American streamside exhibit of the North Carolina Zoological Park in Asheboro have exhibits that can help you learn about the importance of riparian areas and the creatures that depend upon them.

Read and Find Out

- "Discover North Carolina's River Basins" (special publication available from the Office of Environmental Education, N.C. Department of Environment and Natural Resources)

In *Wildlife in North Carolina:*

- "Rivers of North Carolina" special issue, November 1999 (entire issue)
- "Water Pressures" by Brad Deen and Chris Powell, March 2002
- "The Unbroken Cycle of Water" by Lawrence S. Earley, June 1986

Riparian buffers aren't the only water filter in nature. Mussels, which feed by filtering water, remove silt, bacteria and other impurities.

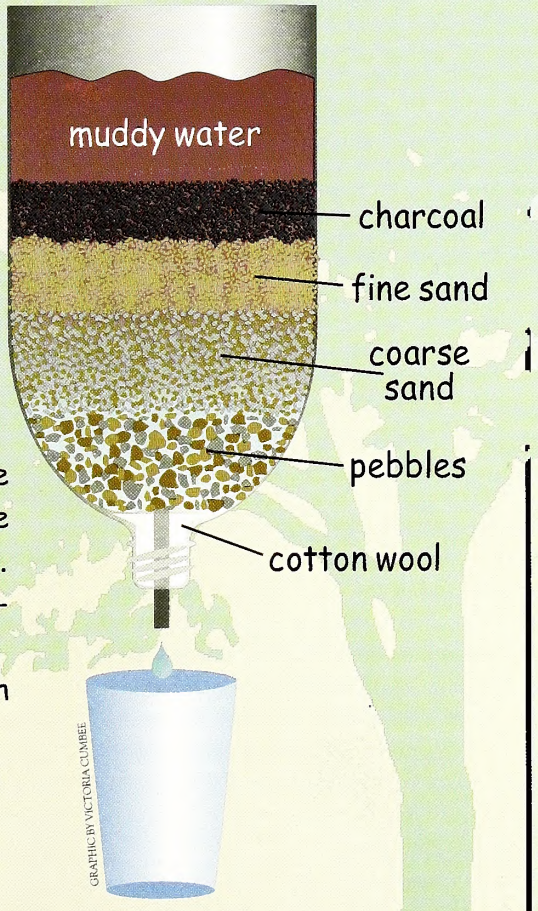
N.C. WILDLIFE RESOURCES COMMISSION

It's Sedimentary!

Items needed:

plastic drink bottle; drinking straw; cottonballs; pebbles; coarse sand; fine sand; wood charcoal; clear cup or glass; mixing container

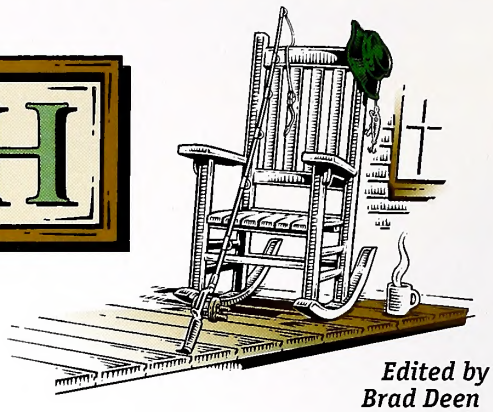
Cut the bottom off a plastic drink bottle. Turn it upside down. Cut a piece of a straw about 2 inches long. Put the straw through the cotton wool and plug the cap opening. (Use two cottonballs if necessary.) Layer with clean pebbles, coarse sand, fine sand and a wood charcoal paste. Mix up some muddy water and pour into the filter. Catch the water in a clear glass as it drips out to see the difference in the water's color. Try to improve the clarity of the water by adding alternate layers of sand and wood charcoal.



GRAPHIC BY VICTORIA CUMBEE

BACK PORCH

News and Wildlife Notes



Edited by Brad Deen

Mine Sealed to Protect Bats

Using innovative mine-gating techniques, biologists recently closed five entrances to an abandoned mine in western North Carolina to protect an endangered bat.

JODY DUGGINS

U.S. FISH & WILDLIFE SERVICE

***Wildlife biologist** Chris McGrath checks a permanent gate at the opening of an old mine that is home to the endangered Virginia big-eared bat (right).*

The site is an abandoned iron mine in Avery County, where the mineral rights have been purchased by the N.C. Wildlife Resources Commission. The mine, one of only two places where the Virginia big-eared bat is found in North Carolina, is a winter hibernation site for the bats. Officials from the U.S. Fish and Wildlife Service and the American Cave Conservation Association joined the Wildlife Commission in installing five gates, one over each of the mine's entrances.

"This is an important step in protecting one of North Carolina's rarest species," said Chris McGrath, a biologist with the Wildlife Commission.

"Building these gates wasn't easy," added Robert Currie, a biologist with the U.S. Fish and Wildlife Service, "but the benefit to the bats is important. It's a small step towards the recovery of the Virginia big-eared bat, with the ultimate goal of taking it off the endangered species list."

One of the biggest threats to imperiled bats is human disturbance, especially during hibernation or during the maternity season. When bats are disturbed during hibernation, they use up precious fat reserves and may not make it through the winter. When they are disturbed during the maternity season, they may abandon their young.

Mine and cave gating has become one of the most effective methods of protecting imperiled species found in these rare habitats. The gray bat, once facing extinction, has rebounded tremendously thanks to cave protection measures. The cave gates look like farm gates on steroids. They're built from thick steel beams that are anchored into the rock surrounding the mine entrances. The beams are placed so the bats can fly between them, in and out of the mine, but humans can't squeeze through.

Building the gates was a challenge because the mine's entrances are well off the paved road. Nearly a quarter-mile of electric cord was used to run power from generators to the electric welding equipment.

Watch Those Striper Sizes!

Striped bass anglers on the Roanoke River should pack a ruler.

The N.C. Wildlife Resources Commission has established slot limits for stripers in this spring's spawning run on the Roanoke. All keepers must be at least 18 inches long, but none can be between 22 and 27 inches long. A striper longer than 27 inches is legal to harvest, but only one of that size can count toward the daily creel limit of two.

The point of the size limit is to protect female striped bass of spawning age, which tend to fall within the 22- to 27-inch range. A slightly different version of the regulation was introduced last year.

Also like last year, striped bass season dates in the Roanoke River basin will not be opened by proclamation, but have already been set:

- March 1–April 15—Downstream from the U.S. 258 bridge near Scotland Neck to the Albemarle Sound. This includes not just the Roanoke, but also the Cashie, Middle and Eastmost rivers and their tributaries.
- March 15–April 30—Upstream from the U.S. 258 bridge to the Roanoke Rapids dam.

KEN TAYLOR

Artist Wins Federal Duck Stamp Competition

Ron Louque, painter of the past three North Carolina duck stamps, recently won the 2003 Federal Duck Stamp Contest.

His painting of snow geese flying near the Assateague, Va., lighthouse beat out 250 other works to win the prestigious competition. Each year, the top painting is printed on the federal duck stamp, issued nationwide July 1.

"It takes a really strong piece to have a chance at winning," said Louque of Charlottesville, Va. "Over the years, I've studied [the contest] closely. To finish in first place is just about more than you can hope for."

Having grown up duck hunting in Louisiana, Louque has had a lifelong fascination with painting waterfowl and is no stranger to success when it comes to duck stamp competitions. He has tallied 26 commissions for waterfowl stamps in 20 states.

The 2002 North Carolina stamp featured his painting "Traditions at Pamlico Point," which showed pintails flying over the Pamlico Point waterfowl impoundment. This painting is the first in a series of duck stamps that feature Wildlife Commission game lands. The prior series celebrated North Carolina's heritage by depicting the birds against state landmarks. Louque's "Black Ducks at Price's Creek Lighthouse" took the North Carolina honors in 2001, and his "Canvasbacks at Whalehead Club" was the 2000 stamp.

This year marked the 30th time Louque had entered the national contest, and he believes his "strong light source" gave the painting a glowing effect that put him over the top. "I chose Chincoteague [National Wildlife Refuge] mainly because of the lighthouse, which made a very distinctive landmark," Louque said. "Plus, it's a wintering ground for snow geese."

Proceeds from state and federal duck stamp sales fund waterfowl conservation. The federal and state duck stamps will be available through the N.C. Wildlife Resources Commission beginning July 1. For more information, call (888) 248-6834, or visit www.ncwildlife.org.

New Crayfish Species Discovered

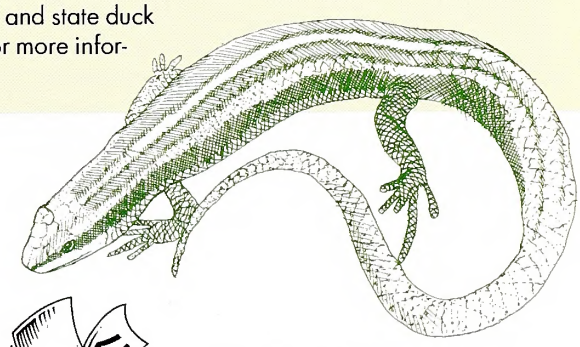
Already rich in crayfish, North Carolina is now known to be even more diverse.

John Cooper, curator of crustaceans for the N.C. Museum of Natural Sciences in Raleigh, has discovered a new species. The Sandhills spiny crayfish inhabits creeks and streams in Moore, Cumberland and Hoke counties. Cooper collected more than 130 specimens, all within the Cape Fear River basin. Most came from Rockfish Creek.

He and son David Cooper, also a curator at the museum, knew about the Sandhills spiny crayfish as early as 1995. The Coopers spent much of the next several years researching the creature and establishing its uniqueness. One unique feature of the species is its side spines, which are common to crayfish that live in caves, but not in surface-dwellers.

North Carolina is known to be home to 37 species of crayfish; others are in the process of being formally recognized by Cooper and other freshwater crustacean researchers. Crayfish, both predator and prey in aquatic ecosystems, occupy a vital link in the food web. Extremely sensitive to water quality, they can also be a strong indicator, through their abundance or absence, of a stream's overall health.

FAYETTEVILLE OBSERVER



Calendar of Events

SATURDAY, MAR. 15

Reptile and Amphibian Day at the N.C. Museum of Natural Sciences, Raleigh, will feature many of North Carolina's native snakes, turtles, lizards, frogs, salamanders and alligators. Call (919) 733-7450, or log onto www.naturalsciences.org.

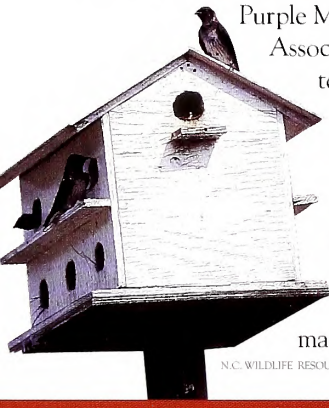
SATURDAY, MAR. 22

The Clay County Chamber of Commerce will sponsor a bass tournament on Lake Chatuge near Hayesville. Call (828) 389-3704, e-mail claychamber@webworkz.com, or log onto www.claycounty-nc-chamber.com.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to chris.powell@ncwildlife.org, or call (919) 733-7123, Ext. 262.

Succeed as a Purple Martin Landlord

For landlords, keeping occupancy high is always a concern—even if your renters can pay you back only with aesthetic pleasure and insect control. March is the month purple martins begin to arrive in North Carolina. Many people put up multiunit martin houses each year, but only a small percentage enjoy success in this tough high-rise-housing market, according to the Purple Martin Conservation Association. Below are the top seven reasons why martin houses fail:



N.C. WILDLIFE RESOURCES COMMISSION

1. *Houses placed too close to tall trees or in yards that are too enclosed* – There should be no trees taller than the martin house within 40 to 60 feet. Martins need unobstructed airspace to fly level to and from their house.

2. *Unwelcome squatters* – At unestablished sites, unwelcome birds must be run off to allow martins to set up shop. This may mean lowering the house to tear out nests until martins arrive. Once martins take up residence, they will develop "site tenacity" and will rarely be intimidated from reoccupying the house in the following years.

3. *Housing placed too far from human houses* – Martins have learned, through natural selection, that the closer they nest to humans, the safer they are from predators.

4. *Housing not painted white* – White martin houses reflect heat better, so martins lose fewer nestlings to heat stress. White also highlights the darkness of the entrance hole and best enhances the male martin's courtship display.

5. *Opening a house too early* – New landlords should not open martin houses until four to six weeks after martins begin to arrive. Older martins tend to arrive earlier and take up residence at pre-established houses. Younger martins, which haven't acquired site fidelity yet, arrive later and are more likely to reside in a new house. Open a house too early, and you'll get squatters.

N.C. WILDLIFE RESOURCES COMMISSION

***Purple martin houses** range from gourds to something resembling a condo (far left).*

6. *Houses not built to specifications* – Much misinformation exists as to what are the best dimensions for building martin houses. The martin association recommends houses with compartment floor plans at least 6 by 6 inches. Those with 7- by-12-inch floor plans are optimal. The entrance should be 1 inch above the floor and have a diameter of 2 inches.

7. *Housing attached to wires* – Martins love to perch on wires, but they tend to avoid houses that are attached to wires. They know that squirrels can gain access to their houses.

Follow these suggestions, and you should have no trouble keeping your wild real estate occupied with happy tenants. For more information, visit the Purple Martin Conservation Association at www.purplemartin.org.

—*Chris Powell*

Red Wolf Pups Thrive in Foster Care

Recovery of the endangered red wolf has gotten a boost, thanks to a wild wolf's maternal instincts. Two pups, a male and a female, were born last spring at the N.C. Zoological Park in Asheboro. When the pups were 2 weeks old, U.S. Fish and Wildlife Service biologists placed them into an existing red-wolf den at the Alligator River National Wildlife Refuge in Dare County. The mother wolf, which had two pups of its own, accepted the zoo-siblings and began to raise them.

Biologists monitored the pack from a distance, using radio telemetry. When the pups were 7 months old, researchers captured all four individually to assess their health, vaccinate them and outfit them with radio collars. All the pups rejoined their family group.

It was the first time zoo-born red wolves were placed into the wild at a very young age. When wildlife officials reintroduced red wolves into eastern North Carolina, creating the only wild population of the endangered species, the animals were young adults bred from captive stock. And although foster mothering is common among red wolves bred in captivity, researchers were unsure how well it would work in the wild.

KEN TAYLOR

Wild fostering of zoo-born pups holds many implications for the successful recovery of the species, and not just because it increases the wild population. It also enhances the genetic diversity of the wild red wolf population. And fostering pups at a very young age increases their overall chance of survival, because it allows the pups to be raised by a wild mother.

EPA Limits Livestock Waste

KEN TAYLOR

Factory-style farms will have to comply with new federal clean water rules. The Environmental Protection Agency in December began requiring concentrated livestock operations to apply for a permit under the federal Clean Water Act. Permit holders must develop a nutrient management plan that sets limits on how much animal waste can be applied to fields.

The most common method used by large livestock farms to deal with waste is to let it run into open pools called lagoons. The waste breaks down into a watery soup of component nutrients—namely nitrogen and phosphorous. The liquid is pumped out of the lagoon and onto a spray field, where it fertilizes planted grass.

The problem with this method is runoff. The lagoons occasionally overflow their banks, or the spray field cannot absorb all the liquid. In both cases, the waste oozes into streams, creeks and rivers. Algae and pfiesteria bloom in the nutrient-rich waters, reducing dissolved oxygen levels and killing fish. The turbid waters eventually flow into estuaries, destroying habitat and breeding waters for many saltwater species.

Under existing law, concentrated animal feeding operations already are required to get permits because they are deemed sources of water pollution under the Clean Water Act. But many operations are exempted from permitting, such as those that say they will discharge waste only during very severe storms.

The new EPA rule, which was a decade in the making, covers concentrated animal feeding operations, large and small. It was the result of a 1992 court settlement between the EPA and the Natural Resources Defense Council, an environmental group.

Melanie Shepherdson, an attorney with the nonprofit group, criticized the rule for leaving too much discretion to states in regulating water pollution, and for remaining largely voluntary. "Basically, the new rule is not going to fix this tremendous problem," Shepherdson said. "In fact, it's just going to give factory farms the legal cover to continue polluting."

On Patrol

Those antlered rodents are sure tough to bring down.

Late last February—three weeks after Groundhog Day and six weeks after deer season—wildlife enforcement Sgt. T.G. Sasser received a call about a suspicious hunter in Durham County. Arriving at the scene just before dark, Sasser slipped into the field and spotted his quarry. He was hard to miss, wearing a blaze-orange hat in a portable tree stand, 15 feet above an 8-acre field planted in orchard grass.

Moving in to investigate, Sasser found the man to be armed with a scoped, .22-caliber rifle loaded with 13 hollow-point rounds. In his fanny pack were a deer call and lure. The man said he was hunting groundhogs.

Sasser noted that he was a bit overequipped to hunt groundhogs—not that any were likely to respond to a grunt call, especially as they were still hibernating. The sergeant charged him with hunting deer in closed season. He pleaded guilty in court.

ILLUSTRATED BY JACKIE PITTMAN

did YOU know?

The state has granted initial approval for an underground storage system that saves water for a non-rainy day.

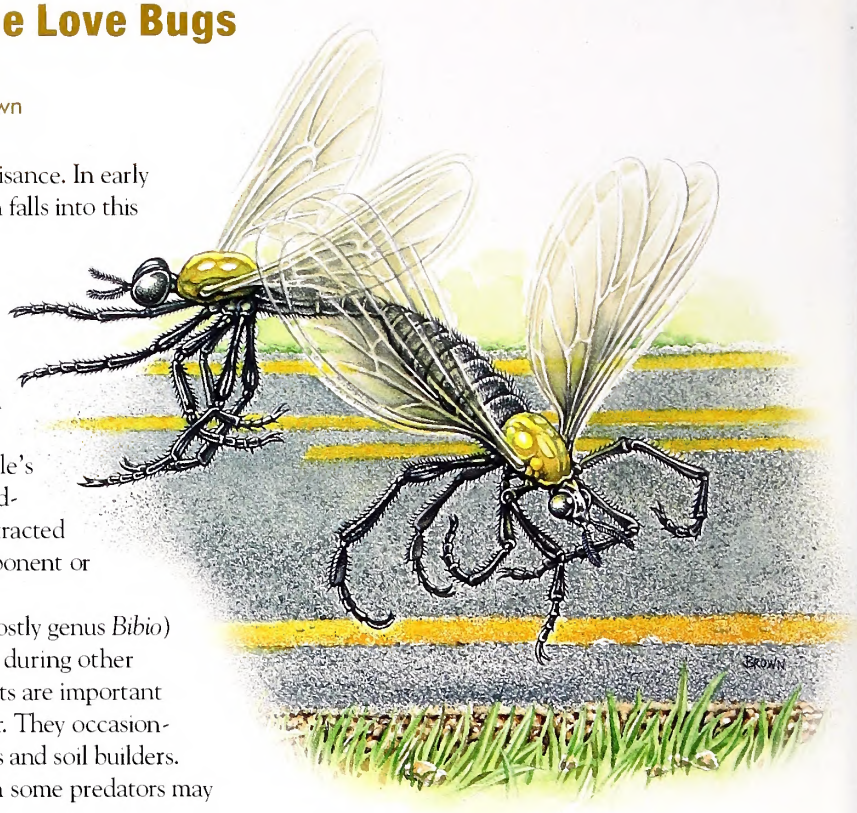
As reported in *Wildlife in North Carolina* last year, Greenville wants to make its drinking water go further by storing it underground. The N.C. Division of Water Quality issued a permit for testing in December. Already in use at about 50 sites nationwide, aquifer storage and recovery could ensure a plentiful water supply during drought or high summer demand. Greenville would treat raw water from the Tar River as usual, but inject any excess into the natural aquifer.

The state permit allows the city, in its first round of tests, to inject 50 million gallons but retrieve 31 million gallons. Drinking water left in the aquifer would form a buffer between treated water and native groundwater. Testing of samples at various intervals would determine whether the method affects either the drinking water or the groundwater.

Nature's Ways

March of the Love Bugs

written by Jeff Beane
illustrated by Jim Brown



Humans often notice wildlife only when it becomes a nuisance. In early spring, an otherwise unobtrusive group of insects often falls into this category. Most appreciated by car-wash owners, these are March flies, family Bibionidae.

Also called "love bugs," due to their habit of mating in flight (and smacking windshields while coupled), March flies are best known in the Deep South. It's here in the South that swarms of *Plecia nearctica*, an introduced tropical species, can impair visibility and clog radiators. Love bug bodies also contain fatty acids that can damage an automobile's finish if not soon removed. But these small, black or red-and-black flies do not intentionally annoy motorists. They are attracted to highways—apparently because of some car exhaust component or because their nuptial flights require open spaces, or both.

Of North Carolina's 20-plus bibionid species, several (mostly genus *Bibio*) emerge in March, but some (*Dilophus, Penthetria, Plecia*) fly during other seasons. They neither bite nor sting. As nectar-feeders, adults are important pollinators. The larvae live in soil, scavenging organic matter. They occasionally damage plant roots, but are also important decomposers and soil builders. Flycatchers and other birds feast on swarming adults, though some predators may find them distasteful.

Whether or not we "love bugs," March flies, like so many creatures, deserve our attention—not because they spatter windshields, but because they are interesting, important, poorly known components of nature.

Road-building Ban Upheld

An appeals court has upheld a ban on building roads across undeveloped federal lands.

Environmental and wildlife groups claimed a victory in the December ruling, which affects 58 million acres, or about one-third of all federally owned and managed forestlands. Logging, mining and outdoor recreation interests had challenged the U.S. Forest Service rule, which prohibits virtually all new roads or other development in roadless parcels.

An official with the U.S. Department of Agriculture, which oversees the Forest Service, said the decision by the California-based 9th U.S. Circuit Court of Appeals is under review. The official said a road ban will take effect, although there could be changes to the one challenged in court.

Catch Us at these *Numbers*

1-800-662-7137 to report violations of hunting and fishing laws

1-800-628-3773 (NC VESSEL) for boat registration and titling

1-800-675-0263 for hunting dates and shooting hours for migratory game birds

1-888-248-6834 (2HUNTFISH) to purchase most licenses with VISA or MasterCard using a touch-tone telephone

1-800-446-8663 (I GOT ONE) to report big game harvests

Connect to the Commission's online Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $49,394,252.27

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

N.C. WILD STORE

Winter weather? Don't despair. Explore the wild from your favorite chair.

What's that little snake with a red belly?

The redbelly snake is one of North Carolina's smallest snakes; it ranges from just 6 1/2 to 12 inches. Although it doesn't bite, it can curl its upper lips in a snarling manner. Is it the little snake in your garden? Our new snake posters can help you identify the snakes you encounter and appreciate the role each one plays in nature. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for venomous and protected species. As a set, the two posters cover all of North Carolina's 37 snake species.
Each poster is 24" x 36".

redbelly snake (Storeria occipitomaculata)

Each poster may also be purchased separately.

LIVEBEARERS
$6 ITEM CODE **P5**

EGG-LAYERS
$6 ITEM CODE **P8**

SNAKES OF NORTH CAROLINA POSTER SET
$10 ITEM CODE **P26**

Rivers of Life

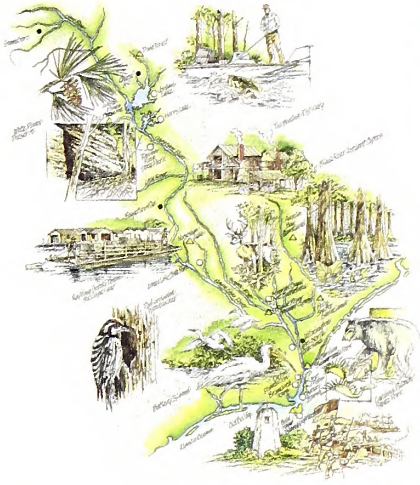
Sale

The natural history of North Carolina's rivers spans millions of years, but our choices for the next few decades will determine their survival. Published in Nov. 1999, this special issue of *Wildlife in North Carolina* chronicles the history and prospects of the state's 17 major river basins. Some of the state's finest outdoor writers and photographers are represented in this 128-page guide to the rivers that link people to each other and wildlife. Includes maps, graphics and a list of organizations that can help you to become a river crusader.

Now at a special price while quantities last.

RIVERS OF NORTH CAROLINA
$5 ITEM CODE **M11**

Cape Fear River Basin



Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Each poster can also be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

▲ Embroidered Caps

Wildlife in North Carolina Caps
Exclusive designs and magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Each poster can also be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Each poster can also be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Items not pictured:

All Things Are Connected

Video and Activity Guide. Based on Chief Seattle's 1855 speech, the film's focus is on environmental ethics. Accompanied by *This Land Is Sacred* teacher's guide, this film is a must-see for everyone. $22 ITEM CODE **W3**

Bird Houses and Feeders

This 8-page illustrated guide to building birdhouses includes construction notes and dimensions, as well as tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE **M6**

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE **M2**

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set.
$2 ITEM CODE **M5**

WILDLIFE COMMISSION SPOTLIGHT

ACCESSING opportunities

The N.C. Wildlife Resources Commission's Division of Engineering Services currently manages 193 boating access areas located throughout the state. In an effort to extend access opportunities for the public, the division enters collaborative partnerships with individuals, corporations, municipalities, counties and state and federal agencies. Most partnerships involve donation of valuable waterfront property for the purpose of boating access facility development. Others include direct cost-sharing for site improvements or new development. Nearly all boating access facilities are developed on land donated or leased to the N.C. Wildlife Resources Commission at a nominal cost.

As the Boating Access Program continues to develop and face new challenges, the Wildlife Commission is thankful for the participation of each partner. Their contributions are vital and significantly extend the Commission's capacity to improve existing boating access facilities and develop new ones. The following table highlights some recent contributors:

JODY DUGGINS

A Wildlife Commission work crew pours concrete at a boating access area.

Access Area	County	Body of Water	Contributor
Flat Creek	Rowan	Tuckertown Lake	Yadkin Inc.
Lemmon's Branch	Swain	Fontana Lake	Tennessee Valley Authority and U.S. Forest Service
Ocean Isle Beach	Brunswick	Intracoastal Waterway	N.C. Department of Transportation
Powerhouse Pine Creek	Jackson	Glenville Lake	Phyllis and Harold Dargel of Mountain View Marina
Triple Springs	Person	Mayo Reservoir	Progress Energy
Slocum Creek	Craven	Slocum Creek	City of Havelock
Surf City	Pender	Intracoastal Waterway	Town of Surf City
Aurora	Beaufort	South Creek	Town of Aurora
West Onslow Beach	Onslow	Intracoastal Waterway	N.C. Department of Transportation
Catawba River lakes	several	several	Duke Power Co.

Cane Creature

The spotted turtle is one of many species that rely on cane for habitat. To read more about our underappreciated native bamboo, turn to page 22.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

50% recycled,
30% post-consumer content

C43
7.07/4
2003/4

WILDLIFE IN NORTH CAROLINA

APRIL 2003 $1.50

Shad on a Fly

by Jim Dean

RODNEY FOUSHEE

"I kept losing count every time one of those incredibly strong hickories slammed into my fly and tail-walked across the river."

It took awhile—about 40 years—but once I figured out what I was doing wrong, it was easy. Cast, retrieve, bam! Fish on. Again and again, it was virtually the same. For a while, I tried to keep track of how many hickory shad I was catching—even the number I hooked on successive casts—but it was impossible. I kept losing count every time one of those incredibly strong 1-to-2½-pound hickories slammed into my fly and tail-walked across the Roanoke River.

I paused to catch my breath and watch my companion, Harry Bailes, land a particularly fat hickory.

"You know what's so amazing to me?" I said. "I've been trying to catch hickories on a fly rod since I was a second lieutenant stationed in Baltimore in 1963, and I think I'm finally getting the hang of it."

"Some people have a methodical learning curve," Harry observed tactfully.

It is hard to argue that point, especially considering that I was introduced to shad fishing by two of the most skilled anglers on the continent. My closest fishing buddy in Baltimore in the '60s was a young anatomy student at the University of Maryland who was thinking of writing a book on shad fishing. We frequently fished with a night watchman from Frederick, Md., who was already attracting attention because of his skill with a fly rod. Maybe you've heard of these guys. Boyd Pfeiffer's seminal book, *Shad Fishing,* was published in 1975 by Crown Publishers (Stackpole has just released a superb updated edition). Oh yes, that fly-rod enthusiast was a fellow named Lefty Kreh.

Most of our shad fishing was with ultra-light spinning tackle using small spoons and shad darts on the lower Susquehanna River, but Boyd and Lefty were already fly-fishing for shad on smaller tributaries. With their guidance, I caught a few hickories on flies, but my hitch in the Army ended and I returned to North Carolina before I got more than a taste of it.

Back home, I looked for opportunities to catch shad on flies during the spring spawning runs in our eastern rivers. In the late '60s and early '70s, there was already a growing light-spinning-tackle sport fishery in some of our rivers and streams for hickories and the larger American, or white, shad. But I had poor luck with flies. The water was often too muddy, my tackle was primitive, and I lacked experience.

Nowadays, modern fly-fishing tackle is far better (especially sinking lines), and water quality and clarity have also vastly improved in many of our streams and rivers—particularly in the Roanoke River. Once famous largely for its heavy spring runs of striped bass, this river is now also a hickory shad hotspot, and the North Carolina Wildlife Resources Commission is working to establish a healthy run of American shad.

Hickories leave the Atlantic Ocean and ascend our rivers to spawn with fishing usually peaking in March and early April. Your favorite panfish or tailwater trout rod is nearly ideal since you want an 8½- to 9-foot rod mated to a 5-, 6- or 7-weight fly line. Most fishermen use intermediate sinking lines (you seldom need a super-fast sinking line). Tapered leaders should be short to keep the fly at roughly the same depth as the sinking line—4 to 6 feet with a 10-pound-test tippet is about right. Hickories aren't leader-shy, and heavier tippets help land fish in the current. Besides, you might hook a white shad or striper.

Any brightly colored fly should work (Boyd's book has lots of patterns), but my friends and I have had good success with simple chartreuse or pink flies tied on hooks in sizes No. 6, 8 or 10. Use Estaz synthetic chenille for the body, a bit of Flashabou at the tail or throat and small lead dumbbell eyes. Small spoon-flies are also good. We often use two flies in tandem.

When I first began fishing for hickories, I was having only modest luck using a fast-sinking fly-line and a slow retrieve. My friend Charles Toney advised using an intermediate line and a much faster retrieve because the fish were higher in the water column, and I was fishing beneath them. It seemed that the faster I stripped line, the more fish I caught.

Harry and I also discovered that, as the season progressed, hickories swim much closer to the surface. Last year, we had terrific late-season fishing using floating lines and unweighted flies. Indeed, we caught so many hickories near the surface that I plan to try them with small, floating poppers this year.

With any luck, you'll have some days when you can't keep track of the number you've caught. And, hopefully, it won't take you 40 years to learn how.

Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

April 2003 *Volume 67, Number 4*

page 10

Features

2 **Paddle the Mighty Roanoke** *written by Ida Phillips Lynch*
photographed by Melissa McGaw
We've all heard of hiking trails. Now a paddling trail offers access into the most remote regions of the Roanoke River.

10 **Sultans of Snap** *written by Jeff Beane*
photographed by F. Eugene Hester
Life isn't always a snap for North Carolina's largest and least-loved freshwater turtle.

14 **Lovie Dovies** *written by T. Edward Nickens*
That clamor of avian activity in your backyard probably means love literally is in the air.

20 **Trout for the Masses** *written by Dan Kibler*
photographed by Jody Duggins
Who says you have to travel to the Smoky Mountains for excellent trout fishing? Two state parks located within an easy drive of North Carolina's population centers provide a variety of opportunities for trout.

24 **Shocking Toms** *written and photographed by Gerald Almy*
Electrify your turkey hunting this spring with these simple "shock" calls.

page 20

N.C. DOCUMENTS CLEARINGHOUSE

MAR 3 1 2003

STATE LIBRARY OF NORTH CAROLINA RALEIGH

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Julie Dunlap* **28**
Back Porch *by Brad Deen* **32**
N.C. WILD Store **37**

Cover *An eastern amberwing dragonfly waits for its wings to harden before taking to the air. Photograph by Melissa McGaw.*

page 28

page 24

N.C. DOCUMENTS CLEARINGHOUSE

APR 2 2003

STATE LIBRARY OF NORTH CAROLINA RALEIGH

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C. and additional mailing offices. Subscription rates: one year $7.50, three years $20, lifetime $100. All foreign subscriptions are $23.50 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.

Paddle the Mighty Roanoke

We've all heard of hiking trails. Now a paddling trail offers access into the most remote regions of the Roanoke River.

written by Ida Phillips Lynch

photographed by Melissa McGaw

Terra firma beckoned. After paddling for five hours in a steady rain, I could hardly wait to stretch my legs and change into dry clothes. I headed up the black waters of the stream, expecting to see the camping platform just around the bend. Instead, I met an impassable logjam that blocked the narrow waterway.

"Is this the right way?" I asked Merrill. "No," he said. "Why don't you look at the map?"

"Map?" I almost choked. "I thought you had the map!"

"I don't have the map!" he responded.

I panicked. Talk about being up a creek! I had packed the sunscreen, but I had forgotten the map. We were somewhere in the belly of Three Sisters Swamp, somewhere in the heart of the Roanoke River floodplain, and nowhere near civilization.

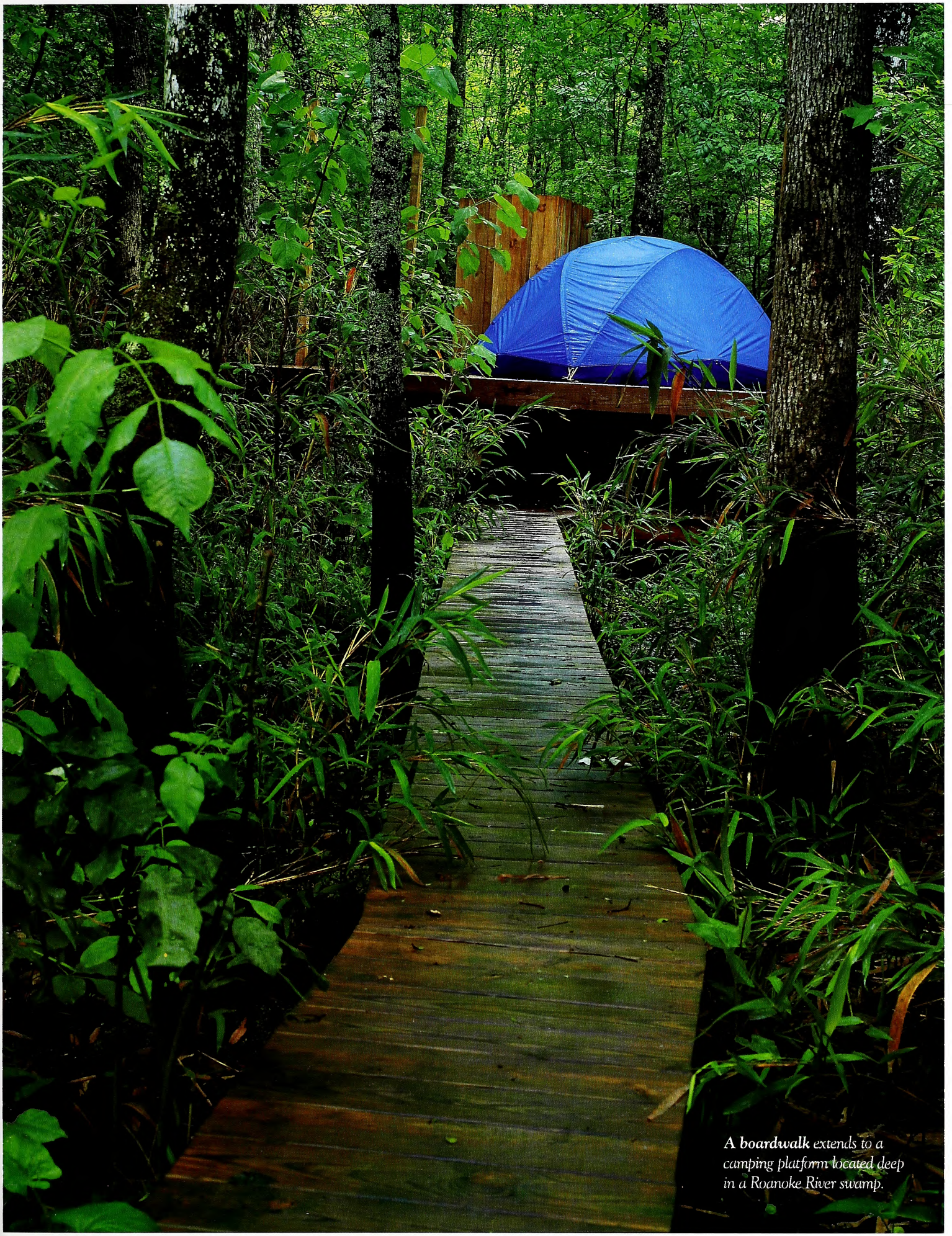
With nighttime approaching, I peered into the sunless swamp, looking for a patch of high ground where we could pitch our tent amidst the catbriers, vines and lush poison ivy. I pictured us huddled on a soggy, brier-covered hummock, shivering in the rain, trying to light our campstove with damp matches while cursing the rain gods and scratching our mosquito bites.

I looked back at Merrill. "But you know the way, right?"

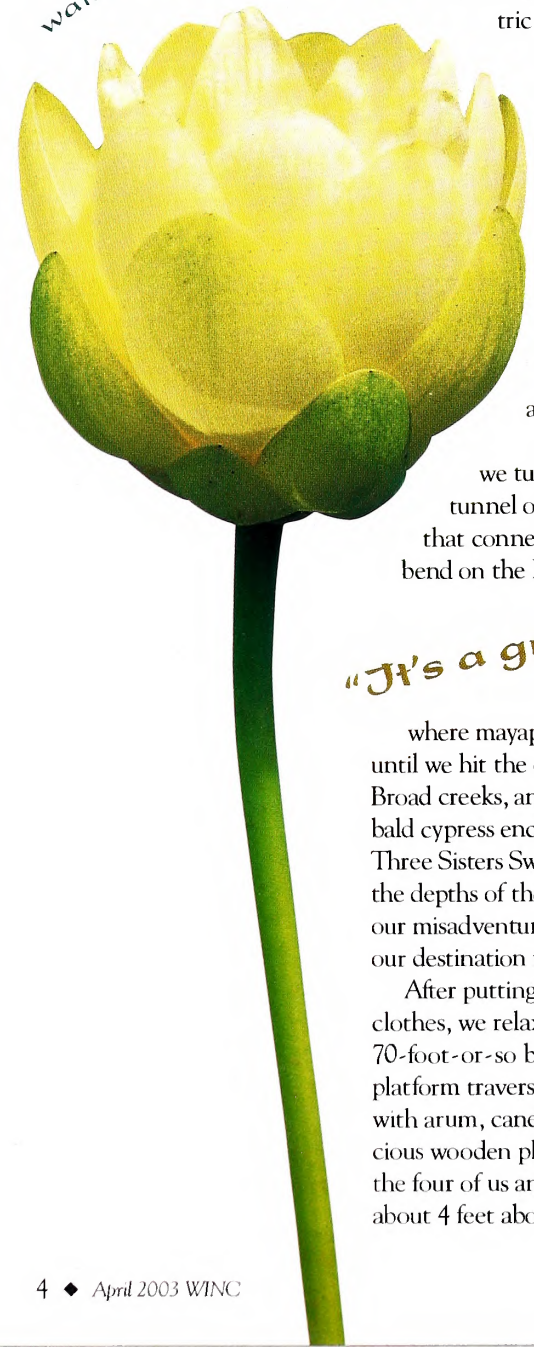
Blessed with a sanguine nature and an inability to admit being lost, he replied: "We just went up the wrong creek. Let's try this one."

A blowdown blocked that stream. But when we paddled up the next creek, I was relieved to spot our friends' bright red and purple kayaks tied to the elusive platform hidden in the swamp forest.

We had been planning this trip on the new Roanoke River Paddle Trail for several months and had reserved the most remote camping platform for a Saturday night stay. The past week had been unusually warm for early May, with highs in the 80s every day and lots of sunshine. I had no doubt that the trend would continue into the weekend. The forecast said something about a chance of rain, but I didn't pay much attention to that. Why bother?



A boardwalk *extends to a camping platform located deep in a Roanoke River swamp.*



Saturday morning I woke up and looked out the window. A dismal, gray, rainy day greeted me. I looked at Merrill. "It's a great day for paddling!" he said with a smile. Morning people drive me nuts.

At the launch site, we crammed our dry bags—which held our tent, sleeping bags, back pads, water, food and a change of clothes—under the gunwales of our open-cockpit boats. As we struck off into the brown waters of the Roanoke, the drizzle escalated into a downpour. I was completely immersed in this rainy river day, with water falling from the sky, water seeping through my clothes, and my boat riding so low to the muddy water that I could feel the steam rising from the river. I began to relax. The rain gave the river a new aspect that I had never noticed before. Raindrops formed endless concentric circles on the water. Wisps of mist drifted around the river. Great blue herons emerged from the forest and flew away from us with deep, slow wingbeats, disappearing into the veil of rain. Spotted sandpipers skimmed over the water and landed on logs, chirping and bobbing their tails. And for once, we did not pass a single boater that day, as the rain kept everyone indoors—save us, the birds and a couple of muskrats.

After paddling for several hours, we turned east and headed up the green tunnel of Cut Cypress Creek, a distributary that connects the ends of a horseshoe-shaped bend on the Roanoke. We paddled through a rich floodplain forest where mayapples carpeted the forest floor until we hit the confluence of Cut Cypress and Broad creeks, an idyllic spot marked by a grove of bald cypress encircled by water lilies. We headed into Three Sisters Swamp, where three creeks penetrate the depths of the bottomland hardwood forest. After our misadventure finding the platform, we arrived at our destination feeling recharged by our journey.

"It's a great day for paddling!" he said with a smile.

After putting up our tent and changing into dry clothes, we relaxed and admired the setting. The 70-foot-or-so boardwalk leading to the camping platform traversed a waterlogged lowland carpeted with arum, cane and lizard tail. The sturdy and spacious wooden platform provided plenty of room for the four of us and our two tents. The platform stood about 4 feet above the damp floor of a cypress-tupelo swamp forest. Cane added a tropical feel to the swamp. Although we heard the hum of a paper mill during part of our trip, we were now far from any human noises. The trees were completely leafed out, and birds were singing and chasing each other through the tangle. As dusk approached, barred owls started whooping it up, hooting back and forth from somewhere in the thicket.

Using our campstoves, we cooked (well, heated up) a dinner of canned Brunswick stew, green peas and hot chocolate. It was still spitting rain, and we were tuckered out from paddling, so we turned in. A rainshower pelting the tent woke me up in the middle of the night, and I momentarily worried that our boats would fill with water and sink. But in the darkness, I listened to the rain and the barred owls hollering like a boisterous monkey troupe and fell back asleep.

The Roanoke River Paddle Trail offers adventurers in canoes, kayaks and small boats a new avenue for exploring the lower Roanoke River floodplain, one of the Southeast's great wilderness areas. Although North Carolina has some 58 designated paddling trails ranging over 1,300 miles, the Roanoke trail is the state's first water route to provide camping platforms. And few of the other trails "have the character that the Roanoke River has in terms of a wild, remote experience," said Joe Jacob, owner of Rock Rest Adventures, a Pittsboro-based paddling outfitter.

As it journeys 400 miles from the southern Appalachians in western Virginia to the Albemarle Sound, the formidable brownwater Roanoke River travels through five counties in rural northeastern North Carolina that contain a mosaic of bottomland hardwood swamp forest and farmland. At the fall line at Roanoke Rapids, the river spreads out over a forested floodplain 3 to 5 miles wide in places. The diverse habitats include cypress-gum swamp forest, high levees and hardwood ridges separated by swampy sloughs. From the Roanoke Rapids dam, the last of five dams on the Piedmont section of the river, the river flows unfettered for 137 miles to Albemarle Sound, passing through the type of roadless swamp wilderness that has vanished from much of the Southeast.

Boasting champion-size populations of white-tailed deer, wild turkeys and striped bass, the Roanoke has always been a popular destination for hunters and anglers. Now other types of outdoor enthusiasts are migrating to the region. Birdwatchers are attracted by the greatest avian diversity in North Carolina's coastal plain: 214 species have been recorded here, including

The camping *platforms are remote, so visitors should pack all they need for an overnight stay, including plenty of bug spray during the warmer months.*

88 breeding species, of which 44 species are neotropical migratory birds. Barred owls, wood ducks, herons and egrets are common sights in the floodplain, but hardcore birders will travel from afar to hunt for local rarities such as the cerulean warbler and Mississippi kite. And general nature enthusiasts are intrigued by the charismatic mammals, including black bears, bobcats, river otters and minks, which roam the haunts of the Roanoke.

When it is complete, the Roanoke River Paddle Trail will feature 10 camping platforms and traverse more than 200 miles of the Roanoke and its tributaries, including the 30-mile-long Cashie River. Four camping platforms have been built to date—on upper and lower Deadwater Creek near Jamesville, in Three Sisters Swamp and on the main river channel near Plymouth.

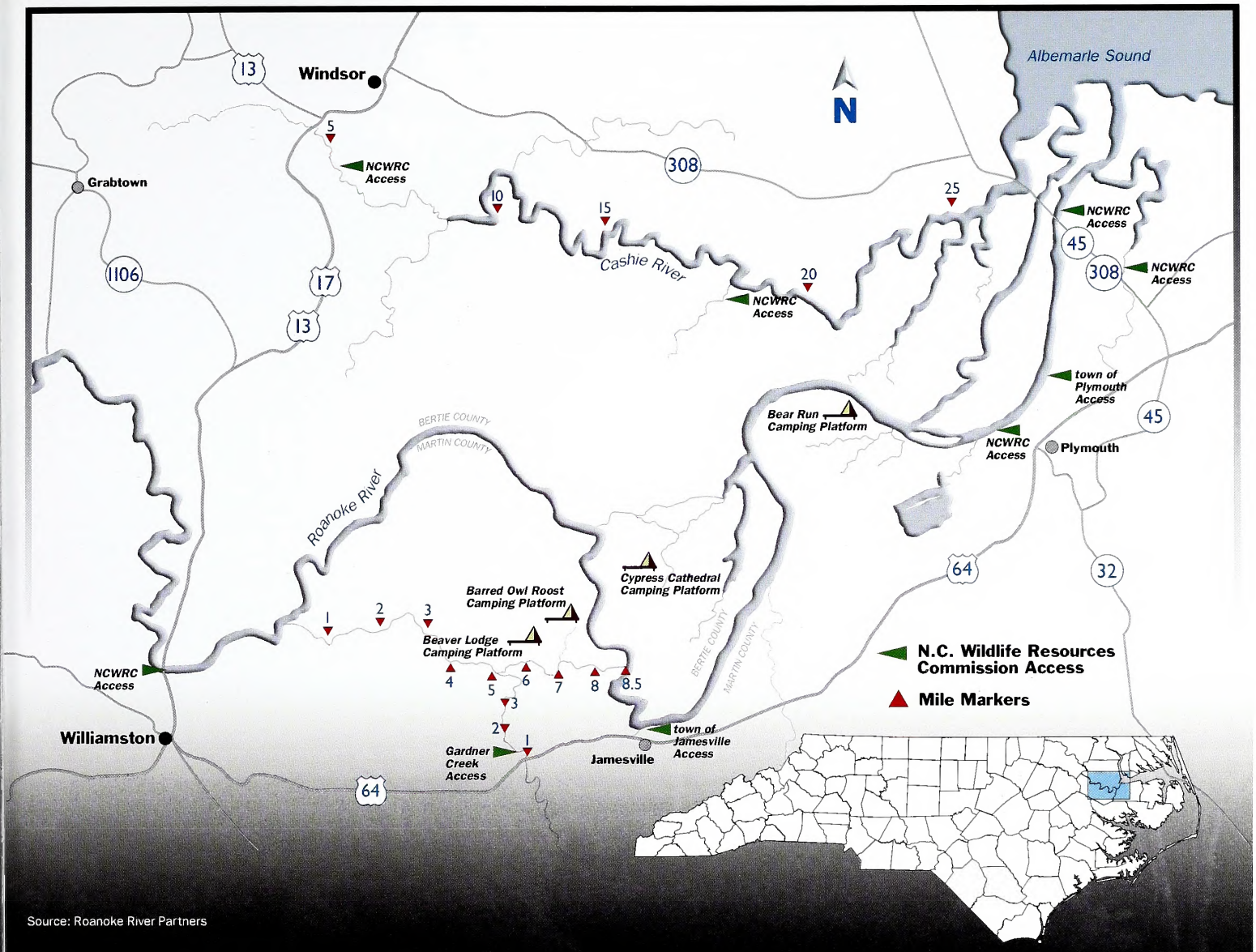
Roanoke River Partners (RRP), a nonprofit organization working to promote sustainable development in Halifax, Northampton, Martin, Bertie and Washington counties, has tackled building the canoe trail as a way of "focusing attention on the region's natural, historical and cultural resources," said Jeff Horton, coordinator of The Nature Conservancy's Roanoke River Project. "The project is helping people in local communities define for themselves the resources they would like to preserve. We are working together to figure out economic solutions for doing this."

By creating the trail, the organization is capitalizing on the five counties' natural link—the Roanoke. "We realized early on that the river presented an opportunity for some type of sustainable economic development that would highlight the region's natural resources without using them up," said Crystal Baity, chairperson of Roanoke River Partners and director of Martin County Travel and Tourism.

Baity hopes that the trail will lure more ecotourists to the region, thereby attracting new business ventures, such as canoe rentals and birding tours, and providing a boon to local hotels, restaurants and sporting goods stores. Financial support for the project has come from nonprofit environmental organizations, including The Conservation Fund and The Nature Conservancy, and public agencies such as the N.C. Division of Parks and Recreation and the N.C. Division of Tourism, Film and Sports Development.

In designing the trail route, a team of experienced paddlers focused on choosing platform locations that offered a manageable distance between put-in and takeout points, showcased the floodplain's diverse

***A barred owl peers** out over the lowlands, likely hoping to spot dinner. The Roanoke River and its rich floodplain are home to a variety of wildlife species.*



Source: Roanoke River Partners

For more information

The Roanoke River Partners Web site contains a description of the paddle trail with maps, photographs and an online reservation form. Paddlers can register for the trail at www.roanokeriverpartners.org or by calling Roberson's Marina at (252) 794-6501. Paddlers should bring all their camping equipment, drinking water and food. The "Rules and Regulations" section of the Web site offers a list of paddle camping gear.

Platform fees (each platform can accommodate up to six campers):
1 camper – $20 per night
2–4 campers – $10/person per night
5–6 campers – $50 total per night

Upon request, special permission for more campers may be granted. The group must meet special conditions, and additional camping fees may be required.

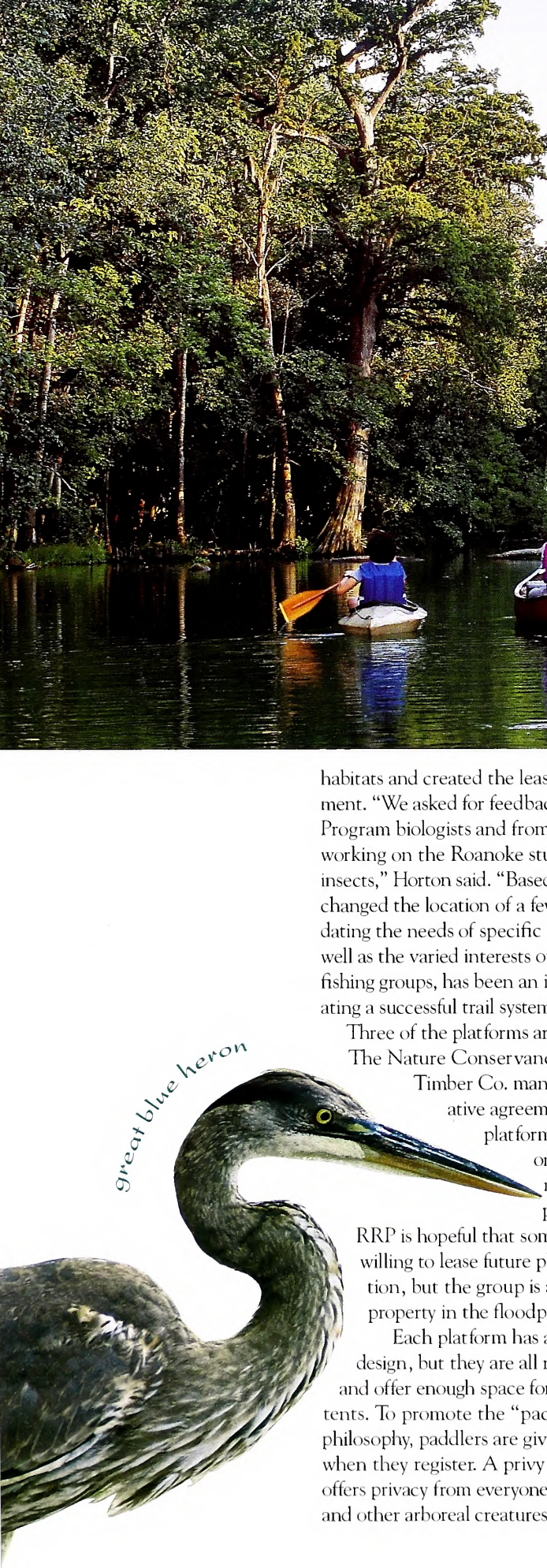
Roanoke River Partners is seeking sponsors to help support the paddle trail. Contact: Roanoke River Partners, P.O. Box 488, Windsor, N.C. 27983-0488, phone: (252) 794-2793, E-mail: info@roanokeriverpartners.org.

For current news and events in the Roanoke River region log onto: www.roanokeriver.com.

habitats and created the least impact on the environment. "We asked for feedback from Natural Heritage Program biologists and from researchers that were working on the Roanoke studying bats, birds and insects," Horton said. "Based on their comments, we changed the location of a few platforms. Accommodating the needs of specific plants and animals, as well as the varied interests of the local hunting and fishing groups, has been an important part of creating a successful trail system."

Three of the platforms are located on land that The Nature Conservancy and Plum Creek Timber Co. manage through a cooperative agreement, while the newest platform—Bear Run—is located on Weyerheauser property near Plymouth. As a nonprofit with a lean budget, RRP is hopeful that some landowners might be willing to lease future platform sites as a donation, but the group is also prepared to rent property in the floodplain from landowners.

Each platform has a slightly different design, but they are all roughly 28 by 16 feet and offer enough space for six campers and their tents. To promote the "pack it in, pack it out" philosophy, paddlers are given a portable toilet when they register. A privy on each platform offers privacy from everyone except curious owls and other arboreal creatures.



great blue heron

The 150-odd groups that have used the platforms since the trail opened in the fall of 1999 have sent in great reviews. "People have told us that they love the platforms," said Jacob, who has organized several weekend camping trips on the trail. "They're pretty amazed by all the night sounds and just being able to get away from it all. I think 95 percent of the people who sign up for our trips are there to unwind. I think it's great that people want to get in tune with the rhythms of the earth when they want to unwind."

Horton predicts that the summertime perils of heat, humidity and biting insects will cause trail use to vary with the seasons. "We anticipate 60 percent of the annual use will fall between March and June," he said. "During the summertime, it will drop way off, and in the fall it will pick up again. Our goal is to have 5,000 visitors a year when the trail system is complete."

"We're hearing lots of positive things about the trail from the community. I think there's an awakening happening."

Paddlers who are not eager to bivouac in a swamp can reserve the platforms and use them for picnic/observation spots during the day, and then spend the night in a local hotel.

But Roanoke enthusiasts think many vacationers will find the platforms to be an irresistible refuge. "There's still a sense of wildness in the eastern part of North Carolina," Jacob said. "I think at some point it's going to dawn on people that they don't have to drive all the way to Georgia and Florida to get immersed in wilderness. And I think there's a potential for attracting people from the Outer Banks who want to get away from crowds and have a more natural experience."

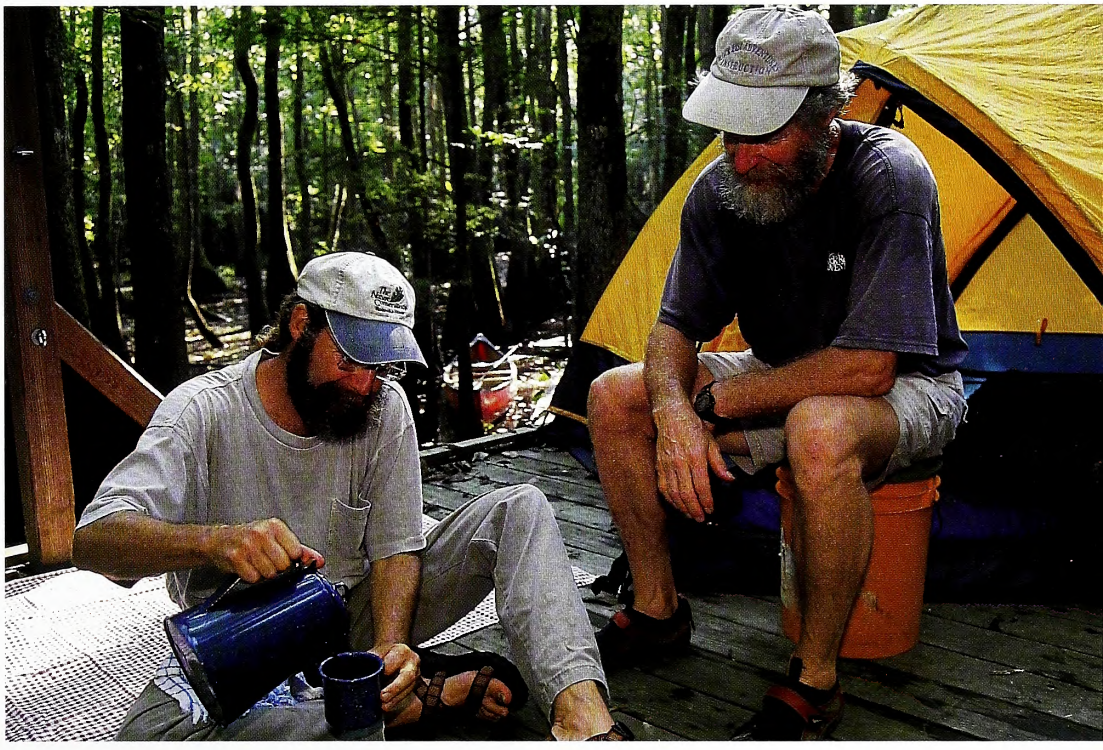
Baity believes that the trail is already helping residents of the Roanoke region look at their backyard in a new light. "We're hearing lots of positive things about the trail from the community," she said. "I think there's an awakening happening. No matter where you live, sometimes you just don't think about what you have in your own community. Sometimes it takes fresh eyes to look at a situation and say, 'This is great!' It makes you appreciate what you have a little bit more."

Sunday morning I woke up to weak sunlight illuminating the tent. The sky was overcast, but the rain had finally dissipated. Cardinals and catbirds flew around us as we made coffee. Merrill found a cardinal nest close to the platform, and we leaned over to peer at the mother guarding her clutch of eggs. A pair of blue-gray gnatcatchers flew by, grappling with each other in a territorial spat. Not too far away, a pileated woodpecker drummed on a tree; the sound seemed to echo from eons ago.

Although I wanted to linger on the platform, we had to paddle about 7 miles to our takeout at the Sans Souci Ferry on the Cashie River, so we loaded our boats and paddled out of the swamp. Mist rose off the water on this cool morning, and swallows and chimney swifts spun overhead, chittering at each other. A fish crow gave a raspy croak, and as if in a retort to this discordant sound, a wood thrush fluted from the shadowy forest.

We drifted for a while in the scenic cypress grove, where parulas, prothonotaries and chickadees flitted around in the trees. A white-breasted nuthatch gave a nasal "cheep" as it hopped up a tree. I paddled up to a cypress and studied it up close. Some of the gray outer bark had peeled off, revealing red bark beneath it. Lacy, forest-green moss glistening with water drops covered the trunk. A bird's shadow floated through the water, and I looked up to watch a great blue heron fly overhead.

It was hard to leave this quiet spot. As we headed down Broad Creek, I started to mentally plan our next trip on the paddle trail. Next time I would definitely write "Map" on the top of my trip list. And next time, we would have to spend more than one night. We had only glimpsed all the possibilities the trail had to offer. I had a feeling that poking around the backwaters of the Roanoke could become a lifelong avocation. I was reminded of a line from *The Wind in the Willows*, something the Water Rat said. I looked it up when I got home, and the words seemed truer than ever: "There is nothing—absolutely nothing—half so much worth doing as simply messing about in boats." ⊠



***What could be** a better start to a day than sipping a hearty cup of coffee before embarking on another stretch of paddling? Campers Don Gray and Joe Jacob enjoy the morning at a Roanoke River camping platform.*

Sultans of snap

Life isn't always a snap for North Carolina's largest and least-loved freshwater turtle.

written by Jeff Beane *photographed by F. Eugene Hester*

You could call it a case of mistaken identity gone terribly awry. I shouldn't have been in such a hurry, but it was one of those "friendly" competitions. Jim Warner had set up a video camera atop the hill overlooking the wet pasture that harbored a population of rare bog turtles we were studying. Most folks hunt bog turtles using a combination of visual search and probing the muck with a broom handle (see "The Stick People," Feb. 2001 *Wildlife in North Carolina*). But techniques differ: Some people are primarily visual searchers, some nearly exclusive probers. Some work the habitat randomly, some selectively. Some use one stick, some two, some none. By filming everyone together and studying the footage, Jim hoped to analyze and learn from the different techniques. Everyone wanted to be first to find a turtle for the camera.

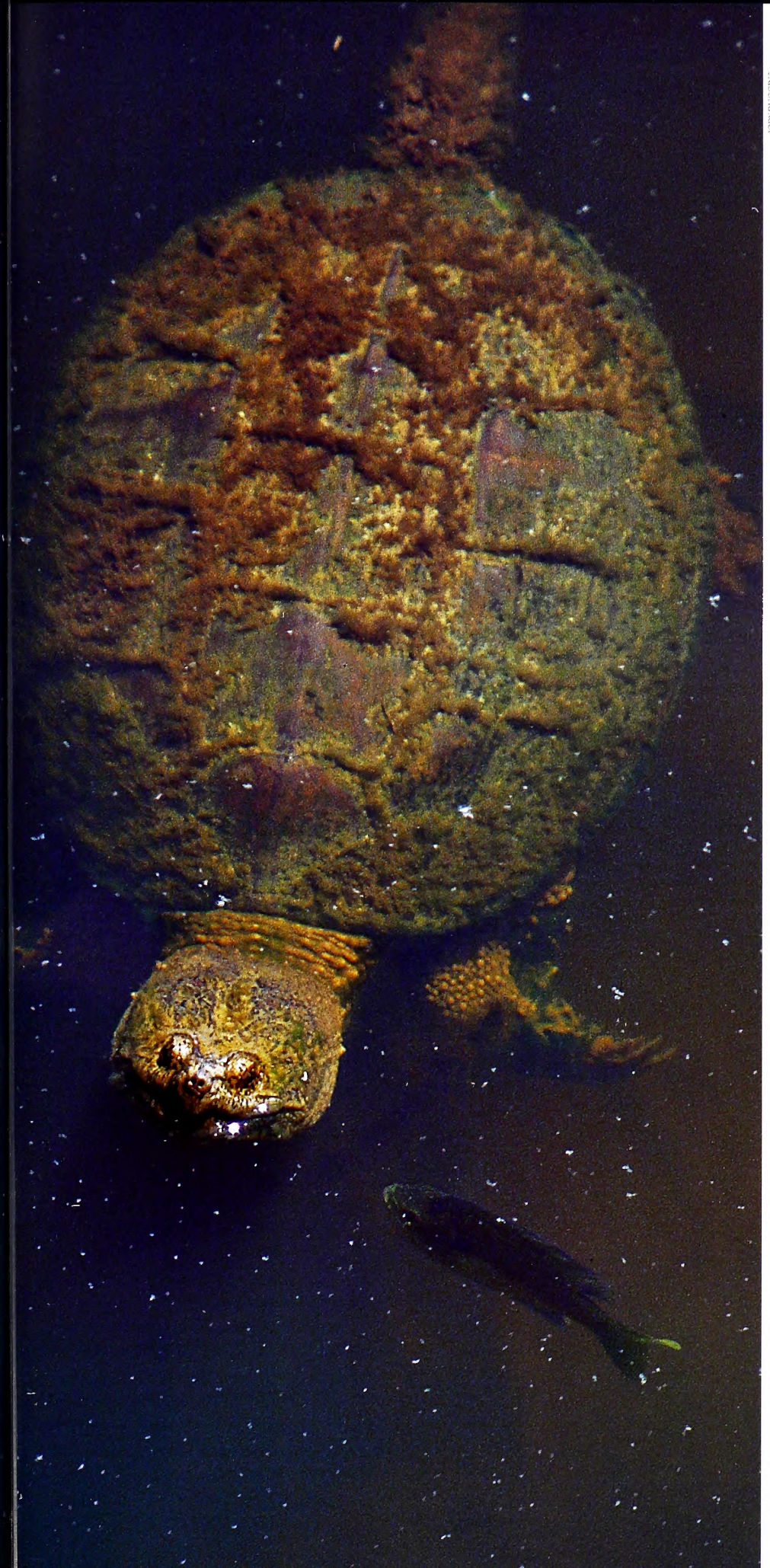
En route to the "good" part of the wetland, I passed through an outlying section of mostly hard ground with water-filled ruts and pools. I jabbed the water pockets quickly in passing—one never knows where a bog turtle might be. When my stick struck a hard, hollow object, I knew it was either a bog turtle or a small snapping turtle. We often probed snappers while hunting bog turtles. Usually it was easy to tell the difference. Adult snappers, being much larger, sound and feel different. But juveniles sometimes fool us. If this was a snapper, it was a little one—safe to reach into the mud after.

Or so I thought. It was a snapper all right, but the great majority of it was nestled in a pocket beneath a hard mud bank. What I had probed was only its head. After several pokes from my stick, the head was more than ready for the next thing that came down to meet it. My reflexes assessed the situation slightly more quickly than my brain, and my hand jerked back, but not before the extreme tip of the powerful, sharp-edged jaws shredded my right index fingertip. I couldn't help wondering what my turtle-hunting technique would look like on Jim's playback as I hurried back to the vehicle for the biggest Band-Aid I could find.

With my most-used finger bandaged, I was slightly handicapped for the duration, but that wasn't what bothered me the most. It was something one of my companions said: "Man, I would have jerked that [blankety blank] out of there and slammed him against a tree!"

Now, right away I could see several things wrong with this line of thought. First of all, we were there to begin with because of our alleged love of turtles. Second, snappers are not humans. Altogether lacking morals, they can no more comprehend revenge than can a rock. Their behavior represents genetic programming—not meanness. Threatened, a box turtle withdraws into its shell. A deer runs. A skunk sprays. A possum plays dead. And a snapping turtle snaps—it's what they do. Also, I, not the turtle, had initiated the attack, if inadvertently. And finally, there weren't really any trees in the site except for small, shrubby tag alders.

So I never even went back to look for the turtle. I had felt enough to know that it was an adult—10 pounds or larger. Large enough to have injured my hand much more seriously. I also knew that a creature had kissed me that even turtle lovers find difficult to appreciate—one that would never receive the respect it deserved.



JOHN DUGGINS

***Its shell provides** little protection, but the snapping turtle has other defenses: a foul-smelling musk, powerful claws and jaws that can easily nip off a finger.*

The common snapping turtle (*Chelydra serpentina*) is North Carolina's largest freshwater turtle and the second largest in North America (after the closely related alligator snapping turtle, *Macroclemys temminckii*, which occurs in the Mississippi drainage and does not range into North Carolina). Snapping turtles are, of course, named for their formidable jaws, quick reflexes and short tempers. Their scientific name means "snake tortoise," perhaps referring to their tendency to "strike" quickly and repeatedly, and their long, serpentine tail, which is armored with large, knobby scutes and measures at least half the length of the shell (much longer than that of any of our other turtle species). Provoked, a snapping turtle is quick to bite and sometimes reluctant to release. Rural folklore maintains that a snapper, having latched onto a human, "won't let go 'til it thunders."

But there's a reason for everything. Most turtles rely heavily on their shells for protection. A snapper's shell, with its tiny, cross-shaped plastron, offers scant refuge. Survival dictates other defenses—large size, thick limbs, heavy claws, massive head, powerful neck and jaws, short fuse and legendary tenacity. Agitated snappers also secrete a foul-smelling musk from glands along the margin of their carapace—a behavior shared with musk turtles (*Sternotherus*) and mud turtles (*Kinosternon*). This feature gave rise to the inelegant colloquial name "stinking Jim" (also applied to musk turtles). Other vernacular names for snapping turtles include "trapjaw," "mud turtle" (or "turkle"), "loggerhead" and "cooter." Most of these are more rightfully

Rural folklore maintains that a snapper, having latched onto a human, "won't let go 'til it thunders."

applied to other species. One acquaintance of mine calls them "snapdragons."

Extremely adaptable, snapping turtles occur throughout North Carolina in most aquatic habitats. You might see one walking the rocky bottom of a trout stream, lurking in an ephemeral woodland pool or scavenging a nutria carcass in a freshwater marsh.

Snappers are opportunistic omnivores, eating everything from algae to muskrats. Like most turtles, they must have their head underwater to swallow food. Although often regarded as voracious predators, their diet includes much plant material. They have been observed gulping duckweed from the surface of ponds, and I have seen their stomachs packed with cattail stems, muscadine grapes and tuliptree flowers.

Like most predators, snapping turtles are often maligned for decimating fish and waterfowl populations. And like most predators, they do no such thing. Snappers will certainly take an occasional duckling (as will a largemouth bass or muskie), and they will eat whatever fish they find slow enough (or, more often, dead enough) to catch. But snappers have coexisted with ducks and fish for eons, and some of the best fish and waterfowl habitat in the state abounds with snapping turtles. In fact, I have rarely encountered fish or birds in the many snapping turtle stomachs I have examined. What I have found—besides the mentioned veggies—are crayfish, aquatic insects, blue crabs, water snakes, toads, turtles (including juvenile snappers) and part of a corn chips bag (humans aren't the only junk food junkies).

Snappers can exceed 18 inches in carapace length, and commonly weigh more than 20 pounds. The largest wild specimen reported in North Carolina weighed just over 50 pounds, but fattened captives have exceeded 80 pounds. Males usually attain larger sizes than females.

Highly aquatic, snappers bask less frequently than most turtles, and their shells often become coated with algae. Though strong swimmers, they spend most of their time resting or foraging on the bottom. They overwinter beneath mud and debris at the bottom of ponds or beneath stream banks, but may become active on mild winter days.

Humans often eat snapping turtles, and the flesh is variously said to be reminiscent of chicken, fish, beef or all three. I ate snapping turtle when I was young, but I no longer do so, for several reasons. It's partly a matter of respecting elders—snappers take years to mature, and large adults are important to ecosystems. A few pounds of turtle flesh represent a considerable investment in energy and resources. There is nearly as much meat on a cottontail (or chicken) that reaches maturity in a few weeks, and much more on a deer (or steer) that can be replaced in a year or two. Secondly, snapping turtles are difficult and time-consuming to prepare. I could clean and cook enough bluegills to feed a small army in the time required to prepare a single meal of snapper. Finally, being indiscriminate diners with slow metabolisms, snappers are ideal candidates for accumulating toxic goodies such as mercury, chromium and polychlorinated biphenyls in their tissues. The last ones I ate were taken during a U.S. Fish and Wildlife Service study in the 1980s, intended to assess levels of heavy metals in the Albemarle and Pamlico sounds. Biologists trapped snappers because they were deemed more likely to accumulate toxins than almost any other animal in the region that humans might eat. The tests required liver tissue, which meant sacrificing the turtles. The researchers brought the fresh carcasses to the state Museum of Natural Sciences, where we prepared most of them as complete or partial skeletons. Rather than discard the meat, I took some home and cooked it. Come to think of it, I never did hear the results of that study. . . .

Snapping turtles mate in the water, and their courtship, as one might expect, is a less-than-tender affair. Large male snappers may also attack smaller males, driving them from their territory, or even killing them. For human observers, it may be difficult to determine whether an interaction between two snappers represents romance or territorial aggression.

Like all turtles, snappers lay eggs. Females use their hind feet to excavate a vase-shaped nest, usually in an open, sunny spot with firmly packed soil, sometimes far from water. Nesting normally takes place in May and June (snappers seen wandering this time of year are often females seeking suitable nesting sites, but both sexes may also travel overland for other reasons). Usually about 25 eggs are deposited per clutch, but as few as 10 and as many as 83 have been reported. Snapper eggs are spherical, resembling miniature, leathery-shelled ping-pong balls, like those of sea

turtles and softshells (most turtles lay more oval-shaped eggs).

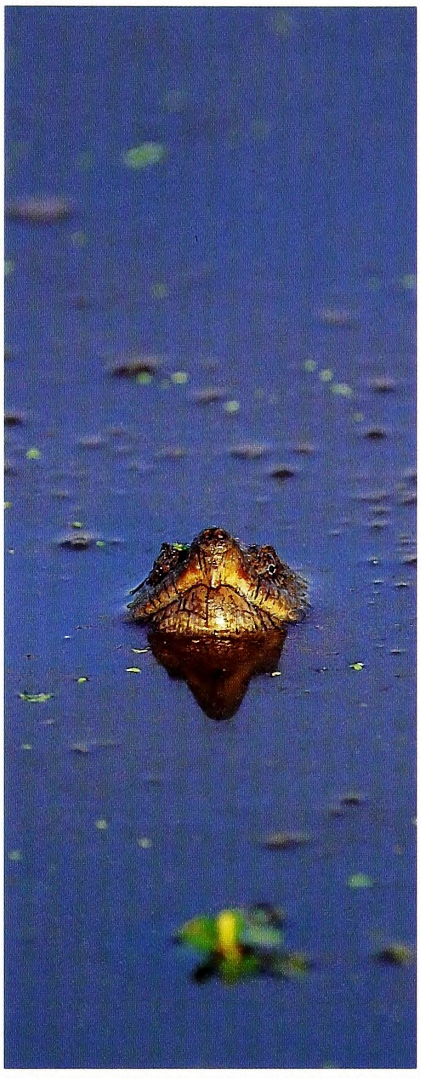
Turtle eggs are a rich food source for wildlife, including raccoons, skunks, foxes and kingsnakes. An adult female snapper feeds many other animals during her lifetime. Predators locate nests by scent, and the great majority of eggs are excavated and eaten. A fresh nest retains a strong scent for the first day or so; if it survives beyond that, odds are good it will hatch. Hatching occurs in late summer or early fall, but hatchlings may sometimes overwinter in the nest and emerge the following spring. Young snappers are often less aggressive than adults. They face a gauntlet of predators until they grow large enough to turn tables on all but the largest and most desperate. Alligators may take adults, and bears, otters, coyotes and even raccoons might kill one on occasion. A few snappers succumb to weather extremes, diseases or injuries inflicted by other snappers, but large adult snapping turtles have little to fear besides humans.

Captive common snapping turtles have lived for nearly 40 years, but they are generally thought capable of living much longer—possibly for up to a century.

Painful encounters like mine notwithstanding, snappers are often relatively complacent underwater, and collectors often feel for them with their hands under stumps and streambanks. They also readily enter baited traps, and a persistent trapper can easily catch virtually every large snapper in a farmpond. Overharvest has led to serious declines in some regions of the country—particularly in the North, where growing seasons are short. However, snappers remain relatively common over most of North Carolina. In every regard, these remarkable reptiles are survivalists.

And incidentally, about an hour after that snapper bit me (and just after Jim turned off the camera), I found (with my left hand) the only bog turtle encountered in the site that day. I still bear a scar and a little numb spot on that finger, but no grudge against that snapper or any other. The experience only increased my respect for an ancient, resilient, adaptable, primitively beautiful animal. The snapper has the will to fight back, in the only way it can, against the only species representing any real threat to its continued existence. ⊠

Jeff Beane is a herpetologist at the N.C. Museum of Natural Sciences in Raleigh.



A good read for adults and children alike is *Minn of the Mississippi* by H. C. Holling (1951, Houghton Mifflin Co., Boston)—a wonderfully written and illustrated tale about a snapping turtle's journey down the Mississippi River.

***Shown eating** water primrose (above), the snapping turtle is more of an omnivore than a pure predator. Ironically, its eggs—which the female (below) is preparing to lay on a beaver lodge—feed countless other species, from snakes to raccoons.*

LOVIE DOVIES

That clamor of avian activity in your backyard probably means love literally is in the air.

WRITTEN BY T. EDWARD NICKENS

MASLOWSKI PHOTOGRAPHY

I don't often wax anthropomorphic, but this time of year I can't see much difference between my backyard and the high school cafeteria a couple of weeks before the senior prom. Come early spring, I can barely make it to the mailbox without some mockingbird or robin strafing me as he shows his stuff for the ladies perched nearby, and the red-bellied woodpeckers drumming on my chimney remind me of teens jamming to loud music. It's ironic, actually, that rarely seen birds such as drumming grouse and gobbling turkeys are better known for their lovesick antics than common backyard and urban-park species. Truth be told, birds of the chickadee, finch and warbler ilk turn my neighborhood into an ornithological singles bar each spring. First, the early-arriving males stake claims and defend their territories, and as the ladies show up there's enough bowing, strutting and gyrating to make a teen-ager blush. Once birds pair up, there are even stranger displays that strengthen the relationship between the newlyweds, kinda like sharing a cup of cappuccino or reading aloud passages from D.H. Lawrence. We see this stuff all the time but don't recognize it for what it is: a whole lotta love, right there in plain view of my kindergartner.

These unusual behavior patterns are called courtship rituals, and they play a critical role in the breeding biology of many bird species. Birds don brightly colored breeding plumage and perform elaborate courtship rituals as part of the effort to attract mates, but there's more going on than simply ogling beefcake. Courtship displays help ensure that bird species identify each other correctly, help female birds judge the ability of a male to provide food and shelter, and give males cues as to which females are ready to breed. Once two birds become a couple, intricate pair-bonding displays help keep the family intact and prepare it for the stresses of bringing up babies.

MASLOWSKI PHOTOGRAPHY

Some courtship displays seem to have evolved to show off the snazzy breeding plumage of many male birds. There are plenty of common birds that exhibit nearly identical plumage patterns in both males and females, such as blue jays, crows and chickadees. Most, however, display sexual dimorphism—a great difference in plumage between males and females—and it serves a critical purpose. Muted colors help the females to stay hidden while on the nest, while bright colors help males attract mates and defend territories. Iridescent

MASLOWSKI PHOTOGRAPHY

***Two tree swallows** (above) use vocalizations during the mating process. Meanwhile, a song sparrow (far left) serenades a potential mate from a mossy log.*

Nearly all bird *species—including cardinals, mourning doves, ruffed grouse and wood ducks—demonstrate unique behaviors during courtship. A great egret (left) performs a dazzling courtship display. Below, a pair of great blue herons touch beaks during a mating ritual.*

MASLOWSKI PHOTOGRAPHY

WILLIAM S. LEA

WILLIAM S. LEA

MASLOWSKI PHOTOGRAPHY

F. EUGENE HESTER

colors, crests, hackles, ruffs and stripes, plus gaudy epaulets, gorgets, cockades and wattles are no mere affectations for male birds, but evolutionary responses to each bird species' strategy for reproduction. In general, the most brightly colored males are confirmed bachelors that mate with multiple females and skip town, shirking all parental responsibility. It's a love-'em-and-leave-'em way of life, and these birds use their bright colors to entice as many females as possible during the breeding season. The lifelong partners—husbands, if you will—are comparatively drab in appearance. Perhaps they are valued more for how they keep up the yard and provide once the young'uns come than how they look on the beach. It's also a general truism that the more brightly colored birds tend to sing less often and with simpler songs—witness the dull-as-dishwater wood thrushes' melodic flute displays. After all, if you look like Brad Pitt, you don't have to sound like Pavarotti. And the more colors birds have to show, the more they show them. A similar dynamic exists in humankind: Why else are gold chains most often displayed on bronzed, buffed chests with collars open nearly to the navel?

F. EUGENE HESTER

*A **female bluebird** holds a tuft of deer hair to line a nest. For most bird species, nesting is an integral part of the courtship process.*

MASLOWSKI PHOTOGRAPHY

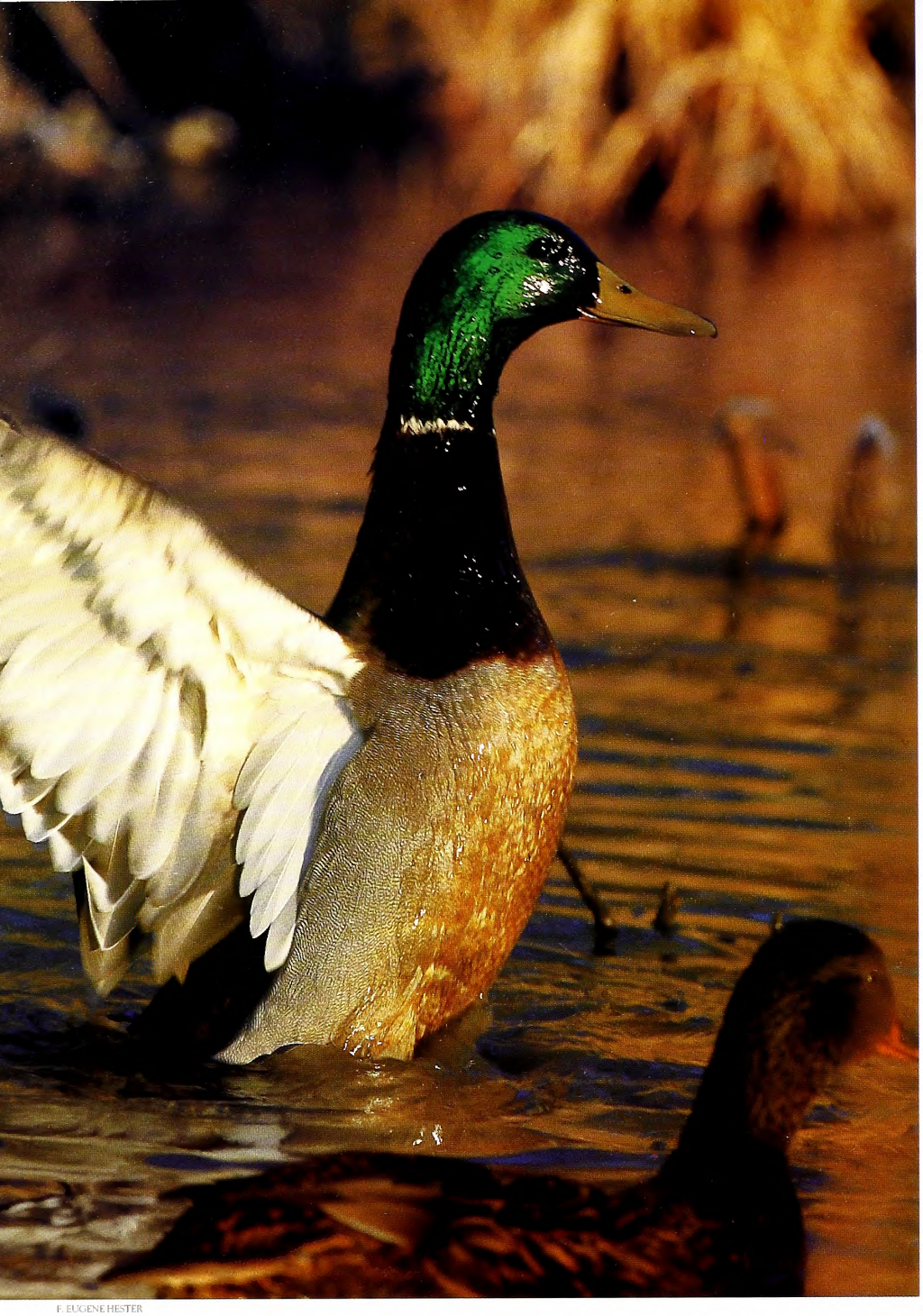
Birds resort to a number of antics to display breeding plumage. On clear days, goldfinches will spiral skyward, letting the sun set their yellow capes afire. Male red-winged blackbirds either perch and spread their wings or fly in labored patterns to show off their crimson epaulets. Towhees spread their tails, revealing handsome spots along the feather margins. Male scarlet tanagers are brilliant red birds with jet-black wings, but when a male wants to impress a female he sidles up to a branch beneath her and drops his wings, exposing a rippling red back. I think I've seen muscleheads do the same thing at sports bars. Male barn owls perform what some ornithologists have called the "moth flight." Hovering in front of a prospective Mrs., the owl displays a distinctive white patch on the chest and belly. It's no six-pack of abs, for sure, but you gotta work with what you have.

BILL EDWARD DUYCK

Male red-winged blackbirds either perch and spread their wings or fly in labored patterns to show off their crimson epaulets.

For many bird species, females seem to be less impressed by the power-packed genes of a brilliantly colored male than by their ability to provide. (The what-can-you-do-for-me? type. I dated a few of those in college.) Marsh wrens are a good example. When attempting to attract a mate, male marsh wrens build several courting nests in dense stands of cattails or sedges. The males then sing to attract females, which inspect the nests one by one. If the female marsh wren accepts the male, she adds a soft lining to one of the nests and settles in. Bluebirds and other species that nest in cavities play a similar game. Male bluebirds will scout a number of cavities in a given area, then show them off to female birds like real estate salesmen. The male perches near the entrance hole to a bluebird box, bowing and bobbing solicitously. *How does it look? Pretty nice view, huh?* Perhaps he'll pick up a stem of grass in his bill. *All it needs is a little TLC—like this little throw rug, here by the front door—what do you think?* But the female, yawning in the nearby boxwood, is unimpressed. So off the male flies, female grudgingly in tow, around the corner. *I have another one to show you. I just* know *you're going to love it.*

All it takes to witness some of these displays is an understanding that birds behave in some batty ways for some very specific purposes. Consider ducks. Hang around a municipal pond for very long in the spring, and you'll surely witness some of the mallard's complex courtship displays. Many duck species have evolved showy breeding rituals, possibly, ornithologists figure, because ducks tend to congregate in large, mixed-species breeding groups that require each species to devise particular ways of identifying its own. Mallard drakes prance and preen in front of hens like jocks at a debutante ball. They rear up out of the water and shake their heads. They shake their tails, partially spread their wings and swim with their necks outstretched, whistling and flicking water at nearby females. The hens



F. EUGENE HESTER

***Mallard drakes are known** for dramatic displays designed to catch the attention of nearby hens and incite fights with rival males.*

put on a show, too. A number of duck species will call and display to attending males to incite a fight, possibly allowing the hens to judge how well a potential mate might be able to drive off a marauding fox. Once a mallard pair is formed, the bond is strengthened with other displays. If you see a drake and hen gently lifting their wings, showing off the brightly colored speculum on the feathers' edges, you'll know it might be time to hide your children's eyes.

One of my favorite courtship displays is also a common one: the "wicka dance" of northern flickers. I saw this performance just the other day. Two male birds squared off on opposite sides of a redbud branch, bills cocked to the sky and tail feathers fanned. You could tell they were up to something. They bobbed their heads up and down and around and around, air-fencing with their long, sharp bills. The flickers fenced for 10 or 15 seconds, then took a break to call with their loud *wicka-wicka-wicka-wick*. A few more seconds of rest and they went at it again, over and over. From the redbud to a yellow poplar, then on to a dogwood. I never saw the female that must surely have been perched nearby, but these fellows were quite determined to prove which was the better bird. Some ornithologists have reported wicka dances lasting all day long.

Another easily observed courtship display is the sky dance of American woodcocks. Find an open field bordering a swampy wooded area in late February, and perhaps you'll see it. Suddenly, you hear a faint, trilling twitter, a series of eerie warbling notes like the turning of a rusty screw. The sound rises over the field, towards the earliest evening stars, 200 feet, 300 feet high, where it seems to hang suspended in the gloaming. Look high overhead and there it is: a woodcock. The bird orbits high overhead, scribes two large circles in the sky, then suddenly slams on the brakes. Cascading to the ground like a falling leaf, chirping and chipping in the descent, the woodcock lands in short grass, then struts about with a stiff-legged gait. *Peent!* he calls, with a nasal quack-bleat-peep. *Peent! Peent!* And then, again, and over and over again, the woodcock catapults towards the moon in an exuberant, acrobatic sky dance to attract breeding females.

Some of these courtship displays are worthy of a few chuckles, once you know what's going on. One fine May morning my front yard had all the trappings of a swinger's convention. On one branch a courtly male goldfinch was bowing to a seemingly impressed female. Over and over, the finch lowered its body flat against the branch, then rose erect again. Not 20 feet away a chickadee was engaged in another weird ritual. The bird walked stiff-legged along a branch, quivering his wings like an Elvis impersonator. All the while, a mockingbird was running back and forth along a grapevine hedgerow, no doubt pointing out potential nest sites to some sweetie hidden in the trees.

If all else fails, of course, there's always the time-honored tradition of gift giving, and nothing says "love" to a female bird like a bit of partially digested fish. Many bird species

If all else fails, of course, there's always the time-honored tradition of gift giving, and nothing says "love" to a female bird like a bit of partially digested fish.

MASLOWSKI PHOTOGRAPHY

display a ritual called "courtship feeding," in which one bird—usually the female, but not always—opens its mouth and appears to beg for food. The attending bird complies with a seed, worm or even a regurgitated insect. Courtship feeding is common. Cardinals, finches, warblers, chickadees and shorebirds are all known to bond in this way, and some studies suggest that sharing resources by courtship feeding does more than cement the birds' relationship. Researchers have shown that the amount of food a male common tern delivers to a female, especially prior to egg-laying, correlates to the total weight of the pair's clutch of eggs. Perhaps egg-laden females that are about to take to the nest weigh so much that foraging is difficult, and their mates work overtime to keep them fat and happy.

So maybe I'm not waxing overly anthropomorphic. I remember what it was like trying to impress the ladies. And birds aren't the only animals that call upon courtship feeding. Even today, when I see a pair of tufted titmice during their courtship feeding rituals, in which the male gently places seeds into the female's open bill, I can't help but remember spoon-feeding milkshakes to Julie, my own bride. ⊠

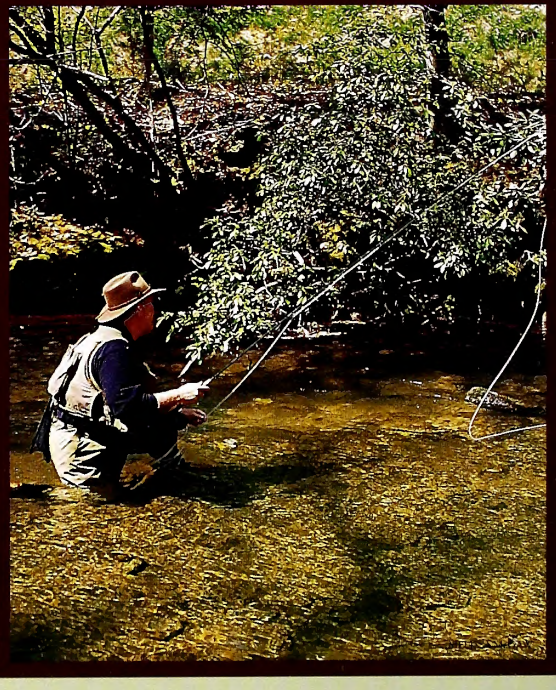
DENVER BRYAN

***A male least tern** observes the time-honored tradition of providing a meal for a potential mate. Below, a woodcock hopes to attract a significant other by displaying its plumage.*

Trout for the Masses

WRITTEN BY DAN KIBLER • PHOTOGRAPHED BY JODY DUGGINS

Who says you have to travel to the Smoky Mountains for excellent trout fishing? Two state parks located within an easy drive of North Carolina's population centers provide a variety of opportunities for trout.



It happened almost 15 years ago, but I remember it like it was yesterday. I was fishing Section 4 of Bullhead Creek in Stone Mountain State Park, flicking a No. 12 Adams dry fly into a long, oval-shaped pool. I had landed one 10-inch brown trout, but I had spent a good 30 minutes trying to trick two enormous browns that were sunning near the tail end of the pool into striking. I changed flies two or three times, but to no avail.

The two trout, which really looked about as long and thick as my lower leg, showed absolutely no interest in my offerings. I took a break, moved upstream about eight or nine steps and started blind-casting toward the head of the pool, a little chute of water that emerged from between two boulders at about a 45-degree angle. I didn't see a big trout anywhere. Frankly, I was just hoping to find something 10 inches long in the fast water to soothe my 20-inch, brown trout headache.

On about my third drift—actually, the first time I got it right—a trout sipped at the surface, and my fly disappeared. It wasn't exactly the 10-inch fish I'd expected or hoped for. It was about twice that long or more. I had it on for about five seconds and got one look at its enormous, torpedo-shaped body before a 90-degree, left-hand turn and a head shake made my cobweb-sized leader part company from the fly.

I know my hands shook at the thought of actually hooking a 20-inch-plus rainbow trout. They shook for quite a while. In fact, I was quite useless from that point on. I fished out the remainder of the beat, not making a single passable cast and certainly not catching anything, before I headed back down the streamside path to my truck.

After a sandwich, a cold soda and a bag of peanuts, I drove about a half-mile, parked at an old, wood-framed Baptist church and hiked 45 minutes up Garden Creek to a place where a 10-inch trout would have been a monster and all of the brook trout I caught were six or seven inches long. I released them all.

On the way home, I paused at a big elbow pool where Garden Creek joins the East Prong Roaring River and waved a greeting to an acquaintance. He was drifting earthworms, and the brace of trout on a stringer tied to his belt bore witness to his abilities as a human seine.

When you think about it, there are not many places where you can fish for trophy trout, tiny natives and hatchery-raised fish within a thousand yards of each other in the same day—and all in public streams. In part, that's why Stone Mountain State Park and its neighbor to the southwest, South Mountains State Park, are attractive to trout fishermen of all kinds, from the Orvis-clad, bamboo-carrying, fly-fishing purist to the guy in jeans and calf-high rubber boots and his 10-year-old son, out with a can of corn, a few earthworms or some salmon eggs, trying to catch supper.

And that's a lot of what the N.C. Wildlife Resources Commission was thinking when it decided how to manage streams within the boundaries of the two state parks. Because they are the closest areas with good concentrations of trout water to some of the state's major population centers—Charlotte, Winston-Salem and Greensboro—the idea to appeal to the entire spectrum of trout anglers took hold.

"The thing that both of these parks have is a variety of the angling experiences that we try to provide with the different programs we have," said Doug Besler, the Wildlife Commission's cold-water research coordinator. "They both have delayed-harvest streams where adult fish are stocked in the fall and the spring, and that allows for some high catch rates during the fall and winter months, and harvest of these trout in the summer. Then, we have numerous streams with wild trout and natural reproduction that we don't manage at all other than set limits and some bait and lure restrictions."

Stone Mountain State Park is located along the border of Wilkes and Alleghany counties, down the mountain from the Blue Ridge Parkway, approximately 25 miles north of North Wilkesboro and an hour's drive from Winston-Salem—90 minutes from Greensboro or Charlotte. The park, which contains almost 14,000 acres of rugged, mountainous land, was the vision of Phillip Hanes, a textile magnate from Winston-Salem who donated 1,100 acres in the late 1960s and early 1970s. Several other donations, plus a handful of major purchases, brought together the majority of park acreage by the mid-1970s.

Stone Mountain State Park has 17 miles of trout streams that are divided into a handful of categories, all of which lie in the Yadkin River drainage. The centerpiece is the East Prong Roaring River, a large stream with two universal-access fishing piers that winds through the heart of the park and that underwent a $600,000 renovation several years ago to improve stream and habitat conditions.

Once managed under hatchery-supported regulations, the East Prong was one of the first streams to be designated as a delayed-harvest stream when the Wildlife Commission started that program in 1994. Those streams, which have become some of the Wildlife Commission's most popular, are stocked at heavier-than-normal levels, and all fishing is single-hook, artificial-lure, catch-and-release-only from Oct. 1 until the first Saturday in June. From June through September, regulations revert to hatchery-supported, allowing anglers to harvest stocked fish. Downstream from the park boundaries, a section of the East Prong covering several miles is in the hatchery-supported program.

"We were trying to diversify and come up with the most opportunities with diverse regulations," remembers Joe Mickey of nearby

***Both Stone Mountain** State Park, near Elkin, and South Mountains State Park, near Morganton, have a variety of streams for trout anglers of all abilities to test their skills.*

KEN TAYLOR

Jacob Fork (left) *is one of the jewels of South Mountains State Park. Stone Mountain (above, center) meanwhile provides awesome vistas in addition to excellent trout fishing.*

For more information, call Stone Mountain State Park (336) 957-8185, South Mountains State Park (828) 433-4772 or the N.C. Division of Parks and Recreation (919) 733-PARK.

State Road, who was the commission's fisheries biologist for northwest North Carolina when the regulations were changed. "Pennsylvania had a delayed-harvest program, and we decided to give it a whirl. The East Prong was an ideal location, because there was easy access with the road parallel to it, it was all under public ownership, it had good water quality, and it was large enough to hold a lot of fish."

Stone Mountain also has a handful of quality wild-trout streams of varying sizes, from tiny Widow Creek (which will challenge even the best fly caster) to Stone Mountain Creek, Big Sandy Creek and Garden Creek, the latter probably the best native-trout water in the park. Big Sandy has four major waterfalls on its run along the south side of Stone Mountain—a 600-foot-tall granite dome that gives the park its name—and it has only rainbow trout. Garden, Widow and Stone Mountain creeks, which run along the south side of Stone Mountain, have brook trout in their upper reaches, and rainbows or browns in their lower elevations.

And the park also has Bullhead Creek, once part of a fishing club of 215 acres that eventually became state property, and which was supplementally stocked by the fishing club, then by Trout Unlimited in the late 1970s. Bullhead is a relatively large creek whose higher reaches, including its Rich Mountain Creek tributary, have enough elevation to be good wild-trout waters, with a lot of brook trout. Bullhead is managed as a catch-and-release only, barbless-hooks, fly-fishing-only stream, and fishermen who pay a daily stream fee are assigned a "beat" or section that's all their own. Anglers gladly pay the fee because Bullhead's trout—in part because of an ongoing program of supplemental feeding—are legendary in size. It's nothing to climb up a few feet off the streamside trail for a better look at a pool and see a half-dozen browns or rainbows bigger than 18 inches, languishing in the clear waters.

"They do get big," Mickey said. "Many years ago, there was a 30-inch brown caught and released, and it was documented."

South Mountains State Park is about 15 miles south of Morganton in Burke County, 25 miles north of Shelby. The first 6,000 acres of the former Civilian Conservation Corps land was purchased in the mid-1970s, and the park now covers almost 17,000 acres. The park adjoins the almost 23,000-acre South Mountains Game Land.

Jacob Fork is the park's most-popular trout stream. It rolls out of the high country managed as wild-trout waters until its junction with its biggest tributary, Shinny Creek. Downstream from that point to the park's boundary, Jacob Fork is managed under delayed-harvest regulations. Shinny Creek and the rest of the park's trout streams, with the exception of the Henry Fork watershed, are managed as wild-trout waters. Within the park's boundaries, the Henry Fork is managed as a special catch-and-release only, single-hook, artificial lures-only stream. It is managed as a wild-trout stream in the game land portion and as a hatchery-supported stream below the park boundary.

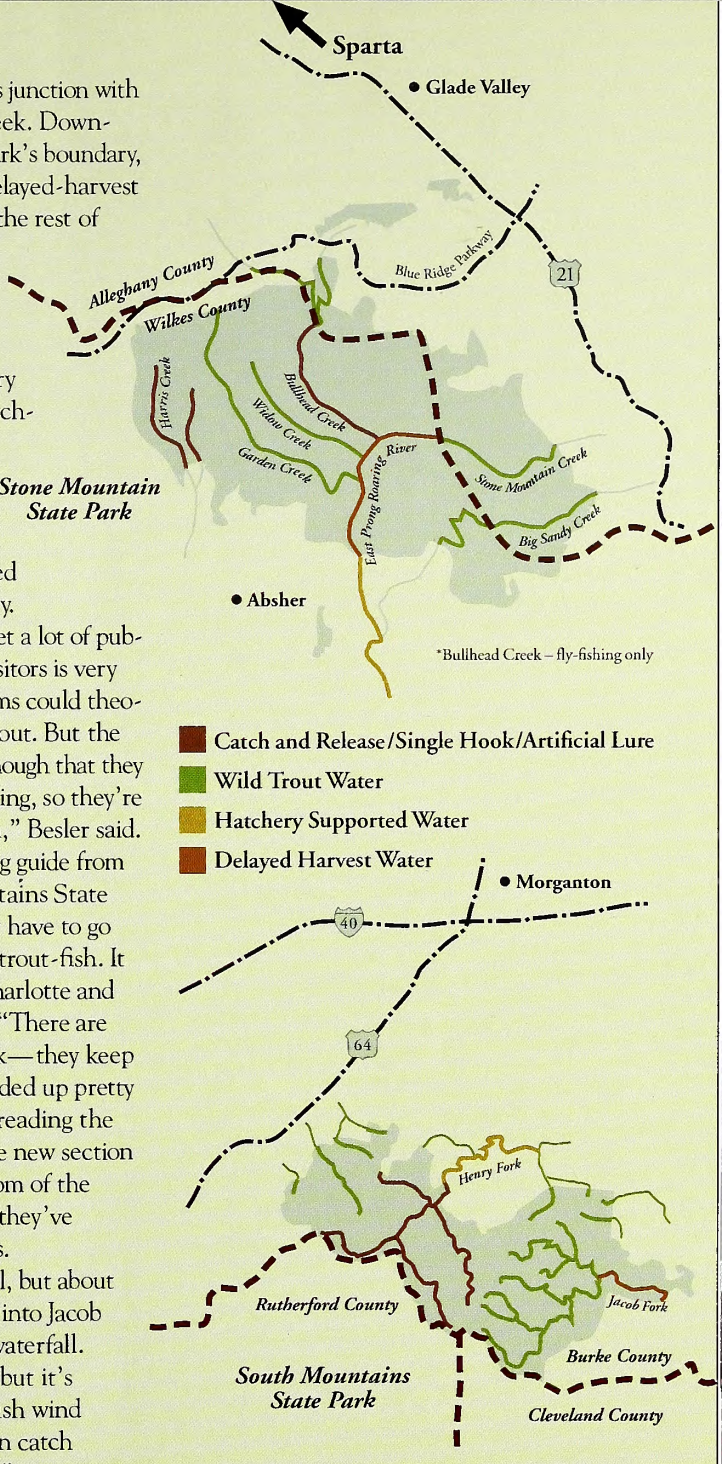
"Streams in the state parks get a lot of public pressure—the number of visitors is very high—and some of those streams could theoretically be managed for wild trout. But the angling pressure could be high enough that they wouldn't provide real good fishing, so they're in the delayed-harvest program," Besler said.

Scott Cunningham, a fishing guide from Morganton, calls South Mountains State Park, "our little gem. You don't have to go clear up into the mountains to trout-fish. It attracts a lot of people from Charlotte and Gastonia and Shelby," he said. "There are several good options. Jacob Fork—they keep the delayed-harvest section loaded up pretty good—but they're good at spreading the fish out. They've added a whole new section of delayed-harvest on the bottom of the stream, about two miles where they've extended the (park) boundaries.

"Shinny Creek is pretty small, but about 100 yards above where it comes into Jacob Fork, there's about a 10-foot waterfall. That's wild-trout water there, but it's where all the delayed-harvest fish wind up, so it's a place where you can catch a few fish and take them home."

Managing Jacob Fork as a delayed-harvest stream actually helps the rest of the park's wild-trout streams as far as fishing pressure is concerned, Besler said.

"In the state parks, people like to come and harvest fish, and we give them the opportunity to catch and keep some fish if they want to during certain seasons, and that also takes some pressure off the wild-trout streams, even though we see very little harvest in wild-trout waters," he said. "Catch rates in our delayed-harvest streams are probably double the hatchery-supported streams. Our data shows that each delayed-harvest fish is caught an average of 4 times. Basically, we're trying to recycle those fish as much as possible, and we adjust the number of fish we stock in certain streams to meet the pressure."



Hatchery-supported regulations include a daily creel limit of seven fish and no size minimum. The daily creel limit on wild-trout streams is four fish, with a 7-inch size minimum.

Camping is available at both state parks in backcountry, family and group situations. Hiking trails crisscross both parks, and plenty of picnicking sites exist. ⊠

It was almost 11 a.m., the day was growing sultry, and the brief flurry of gobbling at dawn had long since faded away. Sore legs and a thirsty throat were all the last few hours had yielded. I was just about to write it off as one of those many turkey hunts we all experience where exercise and pretty scenery are the only rewards, when suddenly a raucous *caaaw, caaw* from a nearby crow broke the morning stillness.

From the opposite ridge, the sound that echoed back was unmistakable—*obble, obble, obble!*

To confirm what I'd heard and pinpoint the bird's location more precisely, I dug around in the vest pockets, pulled out my own crow call and blew on it aggressively—*caw, caw, caw!*

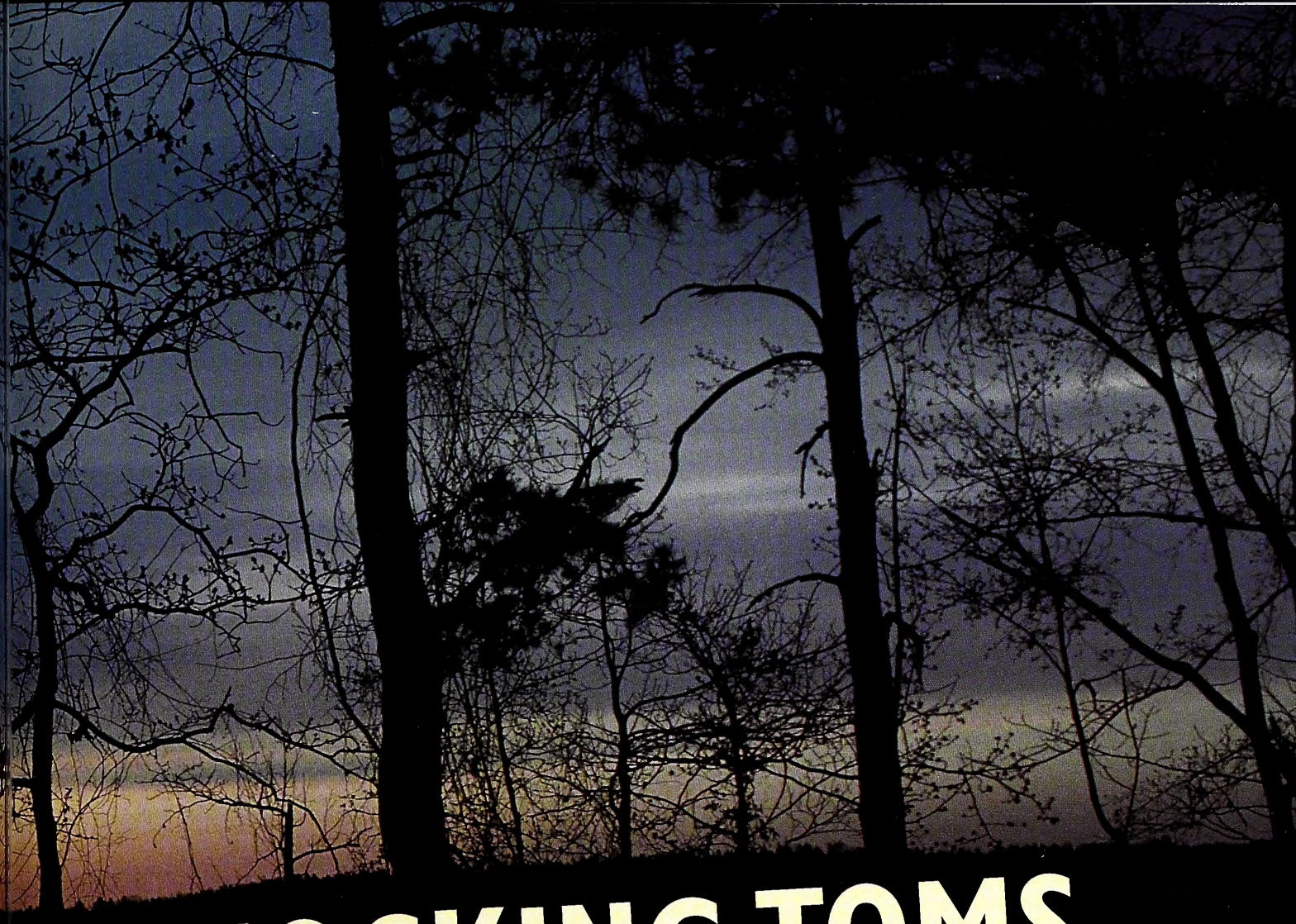
Again the tom bellowed back, and now I had his location pinned down. Setting out at a half trot, I covered ground quickly at first, then eased the last 50 yards until I felt I was as close as possible. Settling back against a thick white oak, I pulled up my face mask and let out a soft, pleading series of hen yelps.

The tom responded immediately. I waited several minutes and called again, but this time there was no answer. Was I back to square one? Somehow I didn't think so and remained alert. Without making another peep, five minutes later the bird stepped into view. Puffed out in partial strut, fired up crimson and cobalt blue, he was easing quietly in towards the call. At 25 yards, the side-by-side 12-gauge fired once, and the bird dropped on the spot.

I don't always need a live crow to remind me to try nonturkey calls to startle or "shock" a gobble out of quiet toms, but I welcomed the help from the feathered black friend that showed up that morning. Had it not been for the crow, I'd have been back at the office before lunch working, instead of basking in the glow of a successful hunt and settling down to pluck the main course for an Easter dinner.

At different times, I've heard turkeys talk back to a flock of geese *her-onnking* overhead, coyote howls, the shriek of a hawk, pileated woodpecker calls, thunder, car horns and truck doors slamming shut. Why they respond to these nonturkey sounds is an open question. It may be territoriality, surprise, an excess of hormones or simple boastfulness. Whatever the reasons, talk back they do.

With turkeys sounding off to such diverse noises, clever hunters have learned that sometimes the best way to get a tom to reveal his location may be to "shock" a gobble out of



SHOCKING TOMS

ELECTRIFY YOUR TURKEY HUNTING THIS SPRING WITH THESE SIMPLE "SHOCK" CALLS.

WRITTEN AND PHOTOGRAPHED BY GERALD ALMY

him using a sound other than a hen call. Sure, that's what we all love to do most—use all the talent we can muster to sound like a lovesick female turkey and lure the tom into clean shotgun range. And you'll still need to do that to complete your hunt. But often a nonturkey call, otherwise known as a locator call, will elicit a gobble from toms that have been pressured too hard and have grown sullen and cautious. A locator call will also elicit responses from birds that are already with hens and don't need to call.

This latter situation is increasingly common today as turkey populations continue to grow throughout North Carolina. With hens all around them, toms have less reason to attract them by calling. That makes shock-gobbling a particularly valuable tool to have in your bag of tricks.

Once you coax out just one call, you're way ahead of the game in trying to harvest a bird. One of the clearest examples of how a locator call can help a hunter collect a tom is using an owl call at dawn. When first gray light starts to arrive and turkeys begin to uncrick their bones and stretch a bit, it's too early for hens to be talking, but an owl hoot is a natural sound in the woods. Since turkeys seem to be aggravated by these big-eyed predators, they'll often gobble if one hoots nearby.

By using an owl call at this time, you can get a tom to reveal his location so you can approach him and get set up while it's still partially dark and he can't see your movements as well. Even if it's light enough that a hen call might bring a response, the owl call is preferable at the start of a hunt because it lets you pinpoint where the gobbler is without enticing him to come to your location. Once you've moved closer to the bird and settled in to the spot you want to call from, *then* it's time to bring out the box, mouth or slate call and send out a few lovesick yelps and seductive clucks.

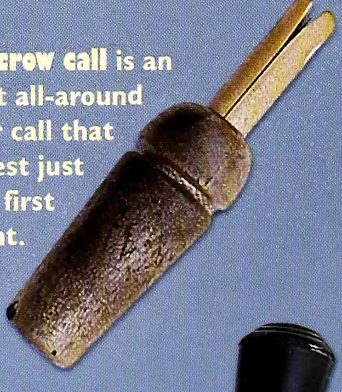
Both flute-type and reed calls work well for imitating owls. A few talented callers can even recreate these bird sounds just by mouth. As a rule, while they are harder to master, reed calls give raspier and more realistic sounds than the flute type. Use the call in a nine-note rhythm as if you were saying the words *Who cooks for you? Who cooks for you all?*

Turkeys will respond to a variety of other bird and wildlife vocalizations, but unlike the owl call most of these work best after the sun is up. If you haven't managed to get onto a bird during the first morning flurry of gobbling,

SCOTTY LOVETT

SHOCK CALL SELECTION

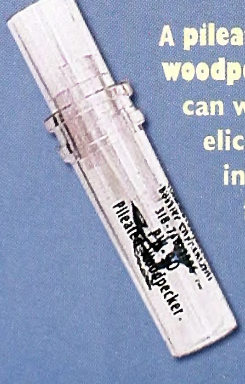
A **crow call** is an excellent all-around locator call that works best just after first light.



A **goose call** can sometimes draw a gobble when a crow call doesn't work.

A **duck call** can make an excellent shock call for turkeys, especially when used around wetlands.

A **pileated woodpecker call** can work well for eliciting gobbles in old-growth forests.



An **owl call** works best at dawn and dusk to elicit a response from a gobbler still on the roost.

then it's time to turn to these. One of the oldest and best types of nonturkey sounds to try is the crow call. Gobblers seem to despise crows. Perhaps they know they are predators and destroy their nests. Whatever the reason, the black birds just seem to irritate a big old tom.

Crow calls will work any time, but the prime time for this locator is just after first light when other birds first start to call. The nice thing about crow calls is that the sound is totally natural, so even if you don't manage to coax a gobble from a nearby tom, chances are you won't spook him. Another appealing aspect of this call is that it's easy to use. Simply blow a series of *caws*, and then listen carefully. Make the call in one direction, wait and listen, then turn and call towards the opposite direction to cover the most territory.

Predator calls that imitate rabbits in distress can sometimes draw responses from toms. The shrill, high-pitched shriek of a hawk is another excellent shock gobble call. I like to use this one at the edge of fields and meadows where the birds are often found searching for their prey. Coyote calls can work well at times, too. The pileated woodpecker is a call offered by a number of companies and can often incite a gobble from a sulking tom. Try these in old-growth forests, where woodpeckers are most common. I've used goose calls at times to stir a response from quiet toms as well as a highball mallard call. Finally, some companies make shock gobble calls that don't imitate anything in particular, but will often spark a gobble from a shut-mouthed tom.

Many of these less-common locators can be good choices in areas where turkeys are hunted hard and crow calls are used a lot. After heavy exposure to them, the birds may grow cautious about answering a *caw*, but bellow back loudly to a hawk, goose or woodpecker call. It's also important to stay flexible. One day a hawk call might work great, but the next day a totally different call might perform better.

A final sound that many consider part of the shock-gobbling arsenal is the gobble itself. The reason it can be considered a "shock" call is that toms don't normally vocalize to lure other toms during spring. But sometimes they *respond* to other gobble calls in a burst of hormonal energy or to lay claim to their territory. You may not bring a tom in with a gobble call, but that's not the purpose. Like other locator calls, you're using it to get him to sound off one time and reveal his location. Then you can sneak a bit closer, set up and try to lure the bird with hen talk.

The one drawback with using the gobble is that if an untrained or careless hunter were nearby, it could be dangerous. The only time I use this call is on private land when I'm certain there are no other hunters in the area.

***Armed with the** right shock call, a determined hunter can usually get a response from even the most stubborn spring gobbler.*

SCOTTY LOVETT

Shock gobble calls can play many tactical roles in spring turkey hunting. One example is when you need to change position on a tom that won't come to your original setup location. As you circle away from the bird and move to a fresh spot, *caw* occasionally or use another locator to keep track of the tom's location and make sure he hasn't moved.

Another use of shock calls is to determine what happened if a tom had started to come to your calls but suddenly grew silent. He *may* simply be on his way and not calling. On the other hand, you might be wasting your time staying put if he's left the area. A shock gobble call at this time will often let you know if he's still coming or is a quarter-mile off and heading away.

While I usually use shock gobbles to locate birds, then set up and lure them with hen calls, there are other alternatives. If you hunt in an area with a lot of pressure, sometimes you can use a hawk, crow or woodpecker call to locate a tom and try to determine where he's going, then sneak to that location and wait him out. If you determine that he's working off a ridge, for example—or heading for a strutting zone, a field or water source—you can get ahead of his likely route and simply set up against a tree and wait. This is more like deer hunting than traditional turkey hunting, but if a bird is call-shy, it may be the only way to take him.

Shock calls are particularly useful for such pressured toms because the bird won't associate the sound with danger, as they might with a human trying to imitate a hen. And knowing you just heard the gobbler and have a hunch where he's going will give you the patience to wait him out on his expected travel route. You can try a soft *purr* or a few quiet *chucks* in this situation if it makes you feel better, but often total silence is best. Hunker back against a wide-girthed tree with your gun propped over your knee and facemask up. You've located the bird by calling, and are simply hunting it with the patient approach the deer hunter shows.

Whether you try the silent wait or use a nonturkey call to pinpoint a bird, then set up and yelp to it aggressively, don't overlook shock gobbling this spring. With North Carolina's growing population of turkeys, most toms don't have to call much to attract hens. They're often surrounded by them. That makes a call that shocks a gobble out of a tom an especially important tool to have in your bag of tricks. ⊠

Crawdads. Mud bugs. Ditch bugs. These creatures have many names because they live in many places. But no matter what you call them, they're

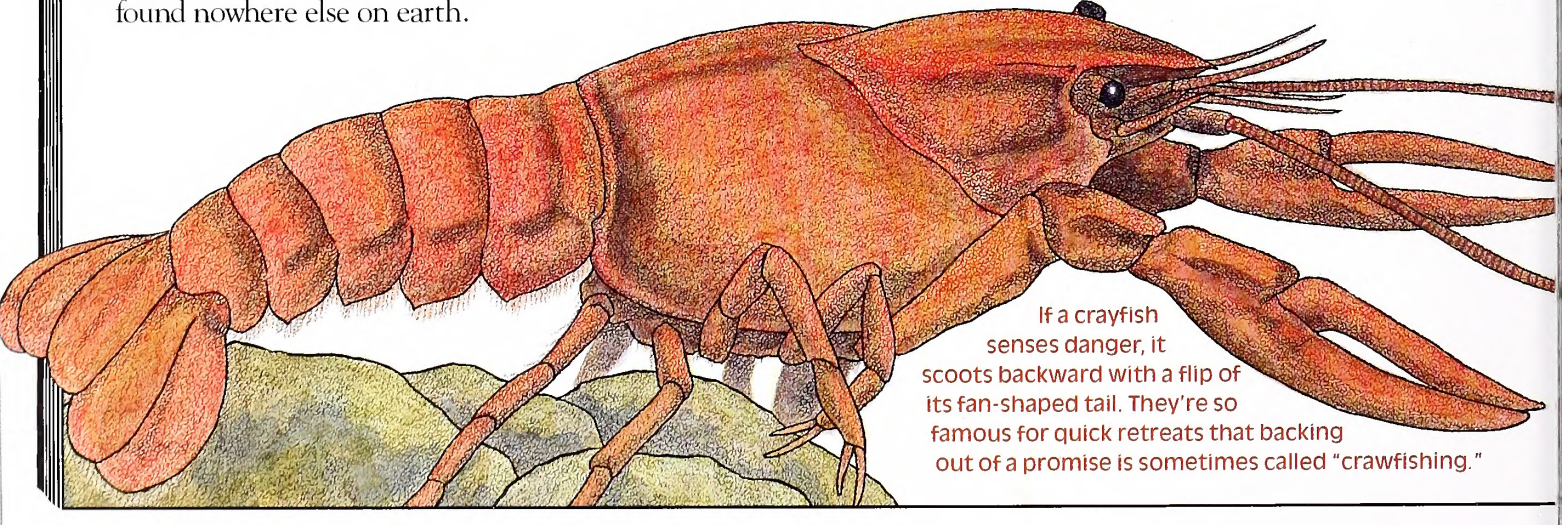
Uncommonly Interesting Crayfish

written by Julie Dunlap / illustrated by Consie Powell / nature activity by Anne M. Runyon

A Crusty Clan

Though they breathe with gills, crayfish aren't fish at all. In fact, they are **invertebrates**, animals without backbones. Crusty outer shells protect their soft bodies and give crayfish and their closest relatives another name: **crustaceans**. Lobsters, crabs and others in the crustacean clan have **antennae**, or feelers, on their heads and have many legs. Crayfish sport four pairs of walking legs and one pair of legs equipped with powerful claws for grabbing food and for self-defense. As most fishermen know, crawdads can pinch!

People often think that all crayfish look alike. But almost 600 species live around the world. Sizes vary from a finger-tip sized American crayfish (*Cambarellus diminutus*) to a Tasmanian species (*Astacopsis gouldi*) that's as hefty as a dinner lobster. Colors and patterns differ too, often blending in with local surroundings. Yet a few cave-dwelling species, such as the eyeless crayfish found in Kentucky's Mammoth Cave, have lost their coloring. The southeastern United States hosts the world's richest variety of crayfish, with about 40 species in North Carolina. Many of the state's crayfish are considered rare, and seven species are **endemic**, found nowhere else on earth.

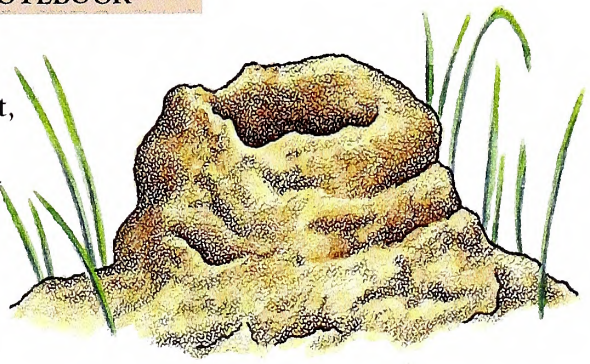


If a crayfish senses danger, it scoots backward with a flip of its fan-shaped tail. They're so famous for quick retreats that backing out of a promise is sometimes called "crawfishing."

LIFE AT THE BOTTOM

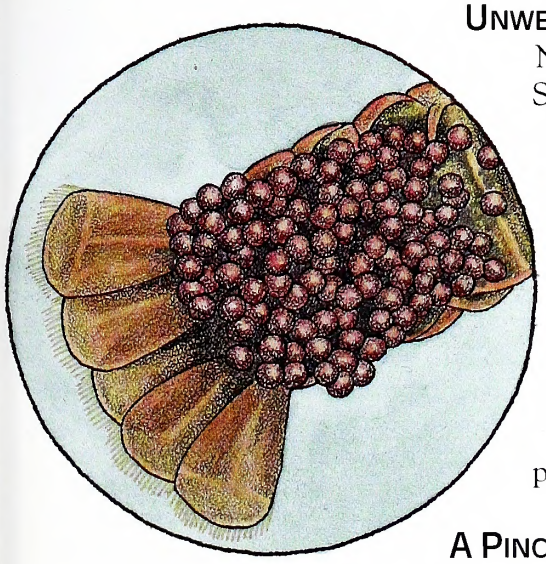
Crayfish live in just about every freshwater **habitat**, from lakes and rivers to ponds and roadside ditches. A few kinds, such as the Greensboro burrowing crayfish (*Cambarus catagius*), dig branching burrows in marshes or wet fields. You may find the lumpy mud "chimneys" of burrowers in your own backyard.

But don't expect to see many mudbugs during the day. They usually hide in burrows or under rocks, avoiding danger, until dark. Then their **nocturnal** activities begin. Sometimes crayfish crawl slowly forward, hunting for snails, tadpoles, worms or fish eggs. They also eat **detritis**, dead plant or animal bits they find along the bottom. Or they may sit still, with only their antennae moving to detect passing prey. If an insect swims nearby—SNAP! It's a midnight snack.



The burrows below a mud chimney built by a crayfish can be 30 to 100 cm deep and have a water-filled cavity hidden at the bottom.

UNWELCOME GUESTS

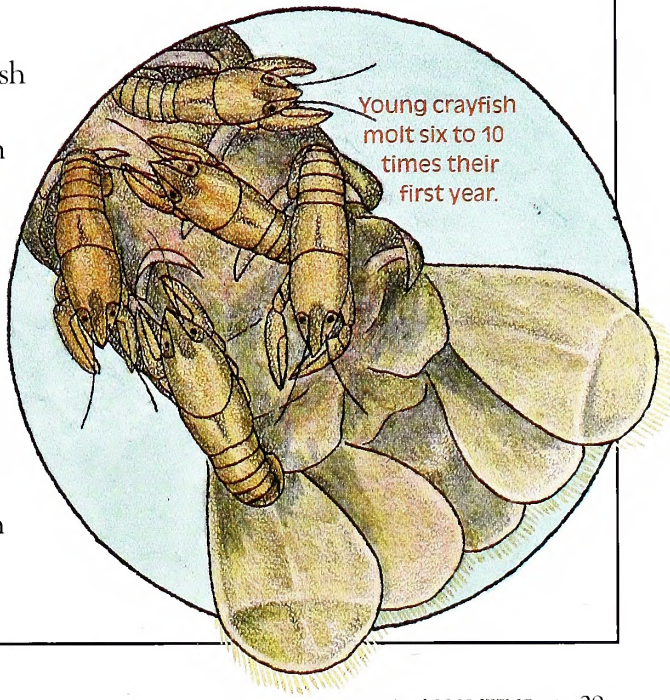


Not all of the crayfish hatching in our lakes and streams belong there. Some are **exotics**, nonnative species that were introduced from other places. Exotic crayfish harm local waterways by eating water plants and squeezing out natives. In Europe, crayfish introduced from America brought along a deadly fungus that nearly wiped out some local populations. In North Carolina and many states, rusty crayfish (*Orconectes rusticus*) and red swamp crayfish (*Procambarus clarkii*) have escaped from crayfish farms or have been released by fishermen from live bait buckets. Native species can't compete for food and hiding places with these agressive species and may die out. No one has yet discovered a way to get rid of these and other exotics without killing natives, so preventing introductions is the best solution.

A PINCH TO GROW AN INCH

With so many hungry enemies, crayfish need to make lots more crayfish. Mating often takes place in the fall, but the female stores the male's sperm until spring. Then she lays from 10 to 800 eggs, depending on her species. A sticky glue attaches the eggs to **swimmerets** on the underside of her belly. If you find a female with berrylike egg clusters under her body, you'd say she's "in berry."

A few weeks later, the eggs hatch to release tiny replicas of their crawdad parents. They stay attached to their mom for protection until after their second **molt**. Crayfish must molt, or shed their shells, because their body armor cannot stretch when they grow. Molting helps crayfish repair injuries by allowing the animals to **regenerate**, or regrow, lost claws or legs. But molting also puts crayfish in danger. The new shells are soft at first, and crayfish must hide from predators until their shells harden.

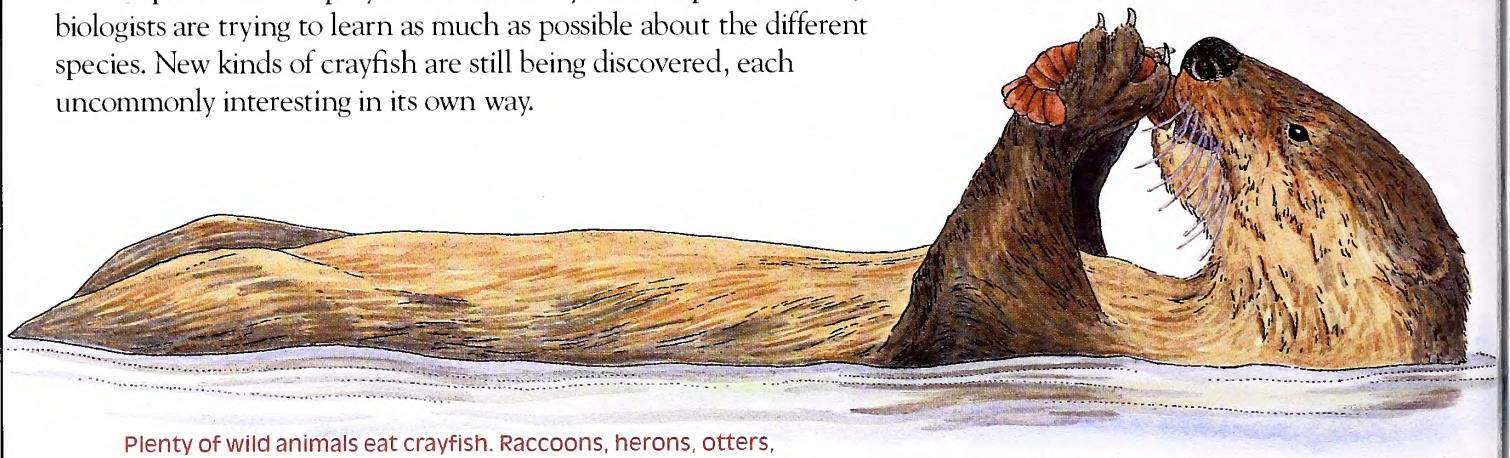


Young crayfish molt six to 10 times their first year.

MEN AND MUDBUGS

For hundreds of years, people have thought about crayfish mostly at dinner. They're eaten by the ton, boiled and fried, in soups, salads and pies. Otherwise, some people don't care much for crayfish. They may blame the animals for building chimneys in their yards or think crawdads are too unimportant to worry about. Or maybe they see crayfish as too tough to be in trouble.

But crayfish face threats from water pollution, dam building, introduced species—anything that damages their watery homes. And streams and ponds need crayfish, important as both predators and prey in the natural system. To protect them, biologists are trying to learn as much as possible about the different species. New kinds of crayfish are still being discovered, each uncommonly interesting in its own way.



Plenty of wild animals eat crayfish. Raccoons, herons, otters, muskrats, snakes and fish are all pleased to grab a crunchy lunch.

What Does It Mean?

antennae: slender structures on an animal's head used for smelling or feeling
crustaceans: hard-shelled invertebrates with antennae and many legs
detritis: debris from dead plants and animals
endemic: occuring only in one limited area
exotic: a nonnative, introduced plant or animal
habitat: the natural surroundings an organism needs to survive
invertebrate: an animal without an internal skeleton or backbone
molt: to shed the outer covering (such as a shell)
nocturnal: active during the night
regenerate: repair by regrowing lost body parts
swimmerets: structures with which a female crayfish attaches eggs on the underside of her belly

Read and Find Out

- "Click, Clack, Claws" by Joan Morse Vistain, *Ranger Rick*, June 1996.
- *The Crawfish Book* by Glen Pitre, University Press of Mississippi, 1993.
- *Crayfish* by Phyllis Grimm, Lerner Books, 2001.
- *The Kingfisher Illustrated Animal Encyclopedia* by David Burnie, Kingfisher, 2000.

On the World Wide Web:

- www.ncwildlife.org (Crayfishes of North Carolina)

Get Outside

Catch a crawdad. Slip on wetable sneakers, grab a fish net, and head for a creek or other shallow freshwater spot. Check the banks for mud chimneys, then peek under rocks and logs. If you try to grab a crayfish by hand, you might get pinched. Instead, use the net. Put it behind your target; a crayfish will scoot backwards if it spots you first. And remember to put everything—rocks, logs and crayfish—right back where you found it. Never release crayfish anywhere except where originally caught.

Dare to compare. Whenever you see or catch a crawdad, make sketches and notes about it. Record its size, color, pattern. Is it "in berry?" Where did you find it, what time of day, and what season? Then look in other places, at other times of day and seasons. What differences can you notice? Even experts have trouble telling different crayfish species apart, but check a field guide to learn about the kinds most likely to be found around you.

Visit the North Carolina Museum of Natural Sciences in Raleigh. Crayfish are treasures, so look for two of our colorful jewels in the Natural Treasures Gallery. What habitats host crawdads? Signs of crayfish can be found in the Piedmont stream and hardwood forest exhibits, too. Then check out the Arthropod Zoo. Crayfish, crabs, shrimp and other crawdad cousins live there, and you can compare their body shapes and living habits. How are lobsters and crayfish alike? How are they different?

It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

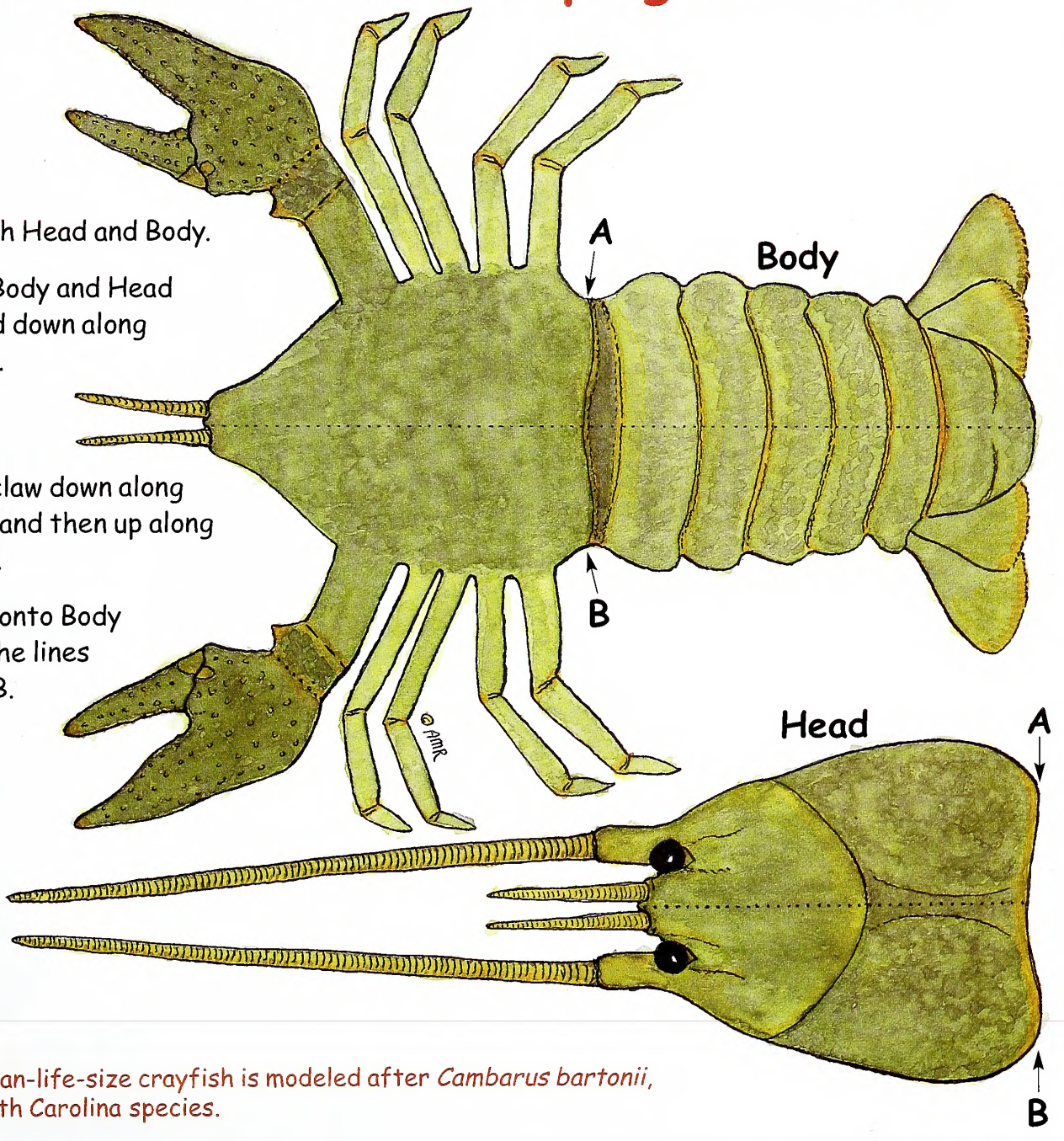
Aquatic Roots teaches students to understand the origins of various species of local aquatic animals and plants, both native and exotic.

Water We Eating? teaches students to identify foods derived from aquatic sources, as well as understand the importance of aquatic environments as food sources.

Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's online Web site at www.ncwildlife.org and click the link for education/workshops.

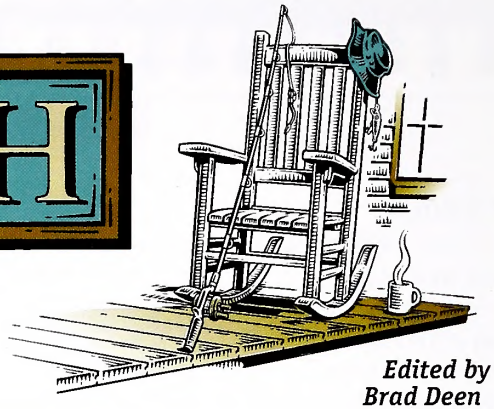
Create Your Own Creeping Crawdad



This larger-than-life-size crayfish is modeled after *Cambarus bartonii*, a common North Carolina species.

BACK PORCH

News and Wildlife Notes



Edited by Brad Deen

Sale to Preserve Unspoiled River, Land

The North Carolina Wildlife Resources Commission has gained more than 4,000 acres of pristine mountain land.

The $17.5 million property known as the Needmore tract adjoins the Little Tennessee River. Duke Energy Co. sold the 4,467-acre forested property. The Nature Conservancy brokered the deal for the Wildlife Commission, which will manage the new game land. It will remain open to the public for hunting, fishing and hiking. "We plan to run it exactly the way it is," said Wib Owen, the commission's game lands manager.

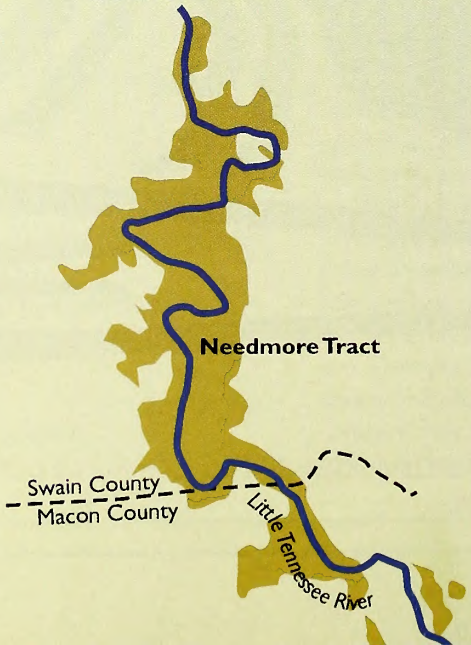
Wildlife will benefit from the acquisition. The Little Tennessee River is home to endangered species such as the Appalachian elktoe mussel and the spotfin chub, a minnowlike fish. Fred Annand of The Nature Conservancy's Durham office said the sparkling mountain waters are "looked at by biologists as an aquatic and biological hot spot because of the sheer number of organisms found in the river that can't be found anywhere else."

KEN TAYLOR

***The Wildlife Commission's** newest game land will protect the Little Tennessee River.*

Besides protecting the waters from runoff and other pollution, the forest provides valuable habitat for countless woodland species. Migratory birds in particular are declining in population because of the lack of wildlife management in forests and fragmentation of what remains. Conservationists in Macon and Swain counties feared the Needmore property would be developed as vacation houses or resorts.

The Nature Conservancy put up much of the funding for the deal, enabling the Wildlife Commission to pursue grants from the Clean Water Management and Natural Heritage trust funds and other environmental funding sources. The commission has already secured $2 million from the federal government for the purchase. The Nature Conservancy will maintain a $2 million stake in the project.

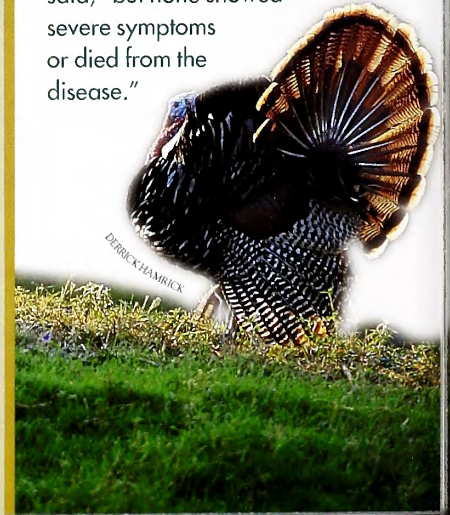


West Nile No Threat to Wild Turkeys

The West Nile virus, which has killed untold thousands of birds and several hundred people in the last few years, doesn't seem to afflict wild turkeys as severely.

"The West Nile virus will not have an appreciable impact on wild turkey populations," said Bob Eriksen, regional biologist for the National Wild Turkey Federation. Wildlife researchers had feared that West Nile would spread to the still-rebounding wild turkey and to flocks of other game birds. The mosquito-transmitted pathogen has most commonly struck crows and blue jays, as well as horses. Since 1999, when it was first reported in the United States, the West Nile virus has spread to nearly every state.

Tests at the Southeast Poultry Research Laboratory indicate that a healthy wild turkey would be unlikely to carry the virus. Domestic poults were exposed to doses of the virus sufficient to cause infection. "All the poults developed the virus," Eriksen said, "but none showed severe symptoms or died from the disease."



DERRICK HAMRICK

Pier Project Enhances Fish Habitat

A pier retrofitted with brushy structure provides better habitat for fish.

N.C. WILDLIFE RESOURCES COMMISSION

Lakefront development can cost fish habitat, as riprap, seawalls and piers replace vegetation and woody debris. To reverse the loss, a partnership including the N.C. Wildlife Resources Commission and Duke Power Co. has added structure under dozens of piers in two Carolina lakes.

Working with 44 homeowners on Lake Hickory in North Carolina and Fishing Creek Reservoir in South Carolina, the team was able to simulate natural fish habitat beneath the piers. Selected piers were enhanced with plastic cratelike structures or plastic structures modified with brush.

"Most naturally occurring complex structures attract fish, and these artificial structures seem to do the same," said Hugh Barwick, fisheries scientist with Duke Power.

The results are encouraging. "Seasonal population surveys during 2002 suggested that total fish abundance was two to four times higher near enhanced piers than at piers without additional structure," said Bob Barwick, a fisheries biologist with the Wildlife Commission.

Habitat enhancement was a hit with homeowners as well. A survey of participants found that 93 percent were pleased with results, and a similar percentage would recommend this habitat-management approach to friends. Many reported greater pier fishing success after the structure was added.

Most piers can be easily retrofitted with these types of structures. "The greatest potential for habitat-enhanced piers would be in reservoirs where considerable residential development already exists, such as Lake Norman or Lake Wylie," said Scott Van Horn, fisheries research coordinator with the commission.

Other project partners included N.C. State University, the N.C. Wildlife Habitat Foundation, Bass Pro Shops, Pure Fishing, the N.C. B.A.S.S. Federation, the U.S. Geological Survey and B.A.S.S. Inc.

Wood Ducks 100 Boxes Richer

North Carolina's wood ducks will have 100 new boxes to nest in, thanks to the North Carolina Waterfowl Association.

The Waterfowl Association's gift to the N.C. Wildlife Resources Commission is part of a multiagency effort to boost the population of wood ducks in the state. The Wildlife Commission will distribute the boxes to suitable private landowners and also install them in wildlife management areas across the state.

Wood ducks nest in natural tree cavities found in old-growth hardwood stands. The decline of such

KEN TAYLOR

habitat—a consequence of logging, development and wetlands drainage—has reduced the number of tree cavities in which wood ducks can brood. Other cavity-nesting species benefit from nest boxes, including the Carolina wren, eastern bluebird, great crested flycatcher, eastern screech owl and hooded merganser.

Eventually, the nonprofit Waterfowl Association plans to install 500 wood duck boxes on state and federal lands and on selected private lands. The association's mission is to conserve, enhance and perpetuate North Carolina's waterfowl heritage. The wood duck represents more than 30 percent of North Carolina's annual duck harvest.

For more information about the association or its wood duck program, call toll-free (888) 524-9191, or log onto www.ncwaterfowl.org.

Wildlife through the Year

Small Game Food Plots

MELISSA McCAW

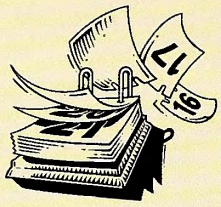
A young quail feeds in a planted plot.

April is an excellent time to plant food plots on your property for small game. But whether you should or not can best be answered with a definite "maybe." By putting in a food plot, you may unknowingly be baiting up a spot for both four-legged and winged predators. Plant food in an area without sufficient cover, and the only things you've helped are the hawks and foxes.

Weedy and brushy areas adjacent to food sources are essential for your efforts to do more good than harm. Plots should be long, narrow and adjacent to escape vegetation. The following plant materials can be broadcast or row-planted from early April in the Coastal Plain through early June in the mountains: Egyptian wheat; sorghum; milo; browntop, German and proso millet; as well as Kobe and Korean lespedeza.

No one wants to patronize a restaurant in the dangerous part of town; nor do wildlife. Plant a variety of the before-mentioned plants in the right location, and you should have a weedy diner teeming with species such as rabbits, quail and songbirds.

—Chris Powell



Calendar of Events

SATURDAY, APRIL 12

Spring Wildflower Wonders at the N.C. Museum of Natural Sciences in Raleigh is a daylong course designed for educators. Highlights will include plant identification, adaptations, conservation and medicinal, folkloric use. Call Mike Dunn at (919) 733-7450, Ext. 620, e-mail mike.dunn@ncmail.net, or log onto www.naturalsciences.org.

SATURDAY–SUNDAY, APRIL 12–13

Earth Day weekend at the North Carolina Zoo in Asheboro will feature activities, demonstrations and exhibitions to create public awareness of the environment. Call toll-free (800) 488-0444, or log onto www.nczoo.org.

SATURDAY, APRIL 26

- Warbler Watch 2003 at the Howell Woods Environmental Learning Center near Smithfield will feature morning and evening bird tours, bird banding demonstrations and bird box checks. Call James Sasser at (919) 938-0115, or e-mail sasserbird@aol.com.
- Songbird Celebration at Blue Jay Point County Park in Raleigh will feature activities for kids and families, bird walks and indoor programs on backyard birds. Call D'Nise Hefner at (919) 870-4334, or e-mail dhefner@co.wake.nc.us.
- Earth Day 2003: A Tree-riffic Event at Gastonia's Schiele Museum of Natural History will celebrate Earth Day and Arbor Day with special programs. Call (704) 866-6909, or log onto www.schielemuseum.org.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to chris.powell@ncwildlife.org, or call (919) 733-7123, Ext. 262.

Fishing Blamed in Seabird Deaths

The deaths of more than 300 seabirds along the North Carolina coast this winter are due to netfishing, federal regulators say. Commercial fishermen, backed by a state agency, deny responsibility.

The birds, many protected by federal and state laws, washed ashore from November to January, mostly along the central coast from Emerald Isle to Core Banks. Biologist Susan Cameron of the N.C. Wildlife Resources Commission said a few dead seabirds turn up each winter, but the toll was unusually high this year. Among the dead were nearly 200 brown pelicans, which were nearly wiped out by pesticides decades ago. Only recently have the birds rebounded to the point that they are no longer listed as an endangered species.

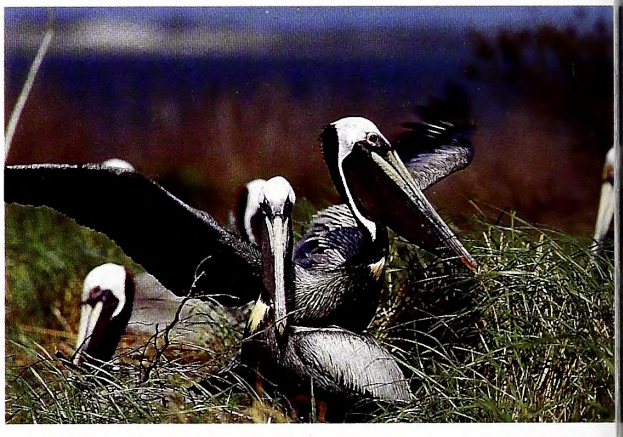
Another 130-plus victims were double-crested cormorants and northern gannets. These large, offshore feeders are not considered threatened or endangered species, but federal law forbids harming them.

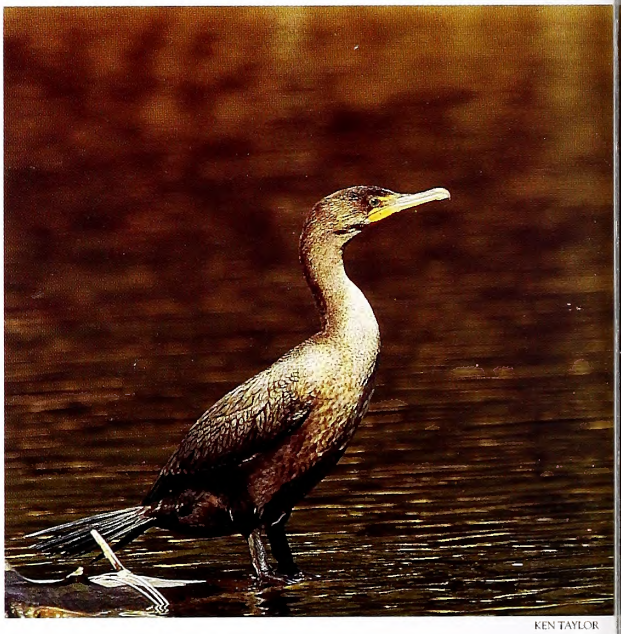
The deaths are still under investigation, but Thomas Bennett of the U.S. Fish and Wildlife Service said many otherwise healthy birds had injuries such as broken wings and deep cuts. That could indicate the birds, which dive for fish, were caught in nets and cut by the nylon strands. Birds killed by fishing boats are an "ongoing problem," Bennett said. "The birds are protected, and something has to be done."

The N.C. Division of Marine Fisheries has pointed out that the seasons for most commercial fishing, such as mullet netting, were over by the time the birds were found. Also, according to Marine Fisheries officials, most fishing nets drop too deeply for a diving bird to become enmeshed.

Jerry Schill of the N.C. Fisheries Association, which represents commercial fishermen, believes his constituency has been unfairly blamed. "I don't understand why it's OK for humans to die of some sort of natural causes, but when an animal dies or something in the water dies, they point a finger at the commercial fishermen," Schill said.

KEN TAYLOR





KEN TAYLOR

***Brown pelicans** (top) and cormorants (above) were among the hundreds of birds that washed onto North Carolina's shores this winter.*

Nature's Ways

Of All the Gall

written by Clyde E. Sorenson
illustrated by David Williams

Every once in a while, you see a sign that Mother Nature has a sense of humor. If you look carefully at the leaves of the white oaks in your neighborhood, you might see one: a bright pink, polka-dotted, fuzzy pom-pom about the size of a nickel.

These colorful oddities aren't tardy Christmas decorations, but galls, the products of insect trickery. The tiny, stingless wool-sower wasp, *Callirythis semenator* ("beautiful seed maker"), lays its eggs in the tender tissue of a newborn oak leaf just as the bud breaks in the spring. When the eggs hatch, the new larvae secrete chemicals that highjack the growth of the leaf. The tissue that would have been the leaf instead produces the fanciful, fluffy and—to the little wasp larvae—highly nutritious growth you see. If you carefully open one of these galls, you will find many small seedlike structures. Each protects and feeds an individual wasp grub that, next year, will pupate and produce another wasp.

There are hundreds of other species of gall wasps inhabiting the twigs and leaves of oaks and other plants, each creating its own distinctive, and often beautiful, gall home.

Contrary to the biological notion of "adapt or die," researchers have found evidence of nature offering second chances.

Dubbed "re-evolution," the twist on evolutionary theory suggests that a species can evolve a trait, lose it, then regain it. The discovery calls into question one of the cornerstones of modern biology: If a species loses a complex characteristic, the gene or genes that express it will mutate so much that the function can never be recovered.

Challenging that tenet is an analysis of DNA from 37 species of the insect order Phasmatodea, or walking sticks, which showed they evolved from winged to wingless and back again—and not just once, but four times.

did YOU know?

Team leader Michael Whiting, an evolutionary biologist from Brigham Young University, told *The Washington Post* he was "shocked" by the findings. "Even though there is no empirical evidence, it has been dogma for two centuries that something like flight requires so many complicated systems that it could only be evolved once, and would be very difficult to reinvent."

Walking sticks exist around the world and there are more than 3,200 species. They come in both winged and wingless varieties.

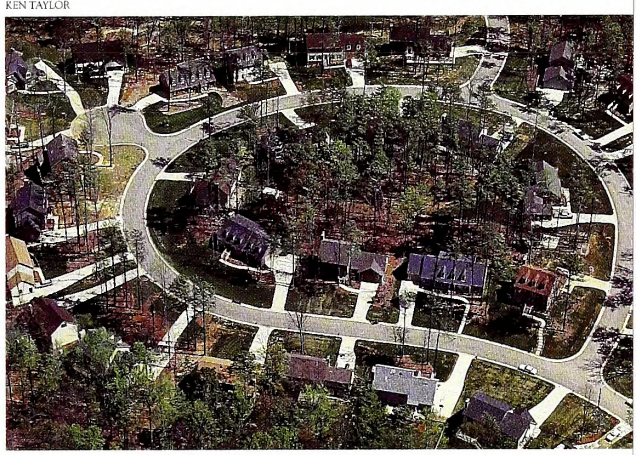
Smaller Households, Larger Houses Stress Environment

Smaller households worldwide are straining the environment, according to a recent study in the journal *Nature*.

Looking at 76 nations considered rich in native species but with environments threatened by human activity, researchers found that annual growth in the number of households eclipsed the population growth rate between 1985 and 2000. Had household size remained at 1985 levels, they would have accounted for 155 million fewer households by 2000.

Those countries, including the United States and China, likely will add 233 million households in the next 15 years, said lead author Jianguo "Jack" Liu of Michigan State University. The international housing boom places more stress on biodiversity and the environment, Liu said, than does the overall rise in world population. As an example, the report cited the giant panda, which has lost supposedly protected habitat inside China's Wolong Nature Reserve to human encroachment.

KEN TAYLOR



Contributing to the decrease in household size are increasing longevity, lower childbirth rates, rising divorce rates and a trend away from sharing homes with parents and grandparents. Despite the smaller households, houses are growing larger as affluence rises. Sprawl is the frequent result.

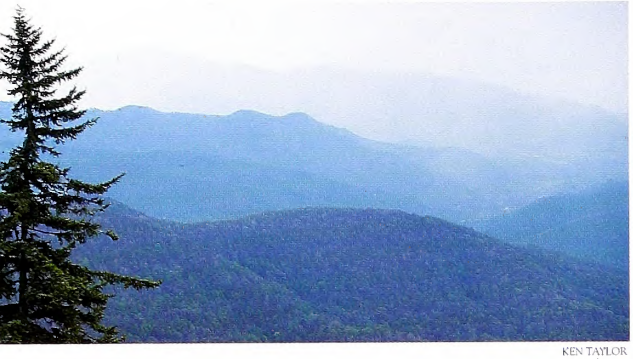
Smaller household size leads to increased resource use and a greater toll on the environment. More wood, stone, glass, concrete and other materials are needed to build the additional homes. Resource use also increases on a per-capita basis with smaller household size. For example, it takes an equal amount of energy to heat and cool a house, regardless if it's home to two people or more.

Liu said the study provides a wake-up call and suggests every household needs to do its part to minimize its impact on the environment.

Smokies, Other Parks in Danger

A national parks advocacy group has declared the Great Smokies and other national parks imperiled.

Air pollution, motorized vehicles and nearby development were the most common citations by the National Parks Conservation Association in its annual "America's Ten Most Endangered National Parks" list. "Designation as a national park alone doesn't protect our parks," said Ronald J. Tipton, a senior vice president for the nonprofit association.



KEN TAYLOR

The Smokies, the nation's most-visited national park, made the list for the fifth consecutive year because of persistent air pollution and other urban-style environmental problems. "It preserves a delicate ecosystem of rare plants and wildlife, as well as historic structures representing southern Appalachian culture," the report noted. And yet, "coal-fired power plants and other sources continue to damage both the spectacular views as well as human and environmental health in and around the park."

The report further cited "pressure from urban encroachment" into the Smokies, especially within the traffic-clogged Cades Cove area. "Local developers and road builders, with the backing of local, state and federal politicians, continue to allow building right up to the park boundary and have even asked to build within the park."

Other national parks making the list include Alaska's Denali National Park and Preserve; Virginia's Shenandoah National Park, which also faces air pollution problems; Virgin Islands National Park, where the fragile coral reefs are under assault; and Ocmulgee National Monument near Macon, Ga., threatened by a proposed highway and deterioration of archaeological treasures.

For the full report, log onto www.ncpa.org.

Sign Up for E-advisories

The N.C. Wildlife Resources Commission has created a wildlife advisories hotline for hunters, anglers, boaters and outdoors enthusiasts interested in receiving periodic e-mails on wildlife-related topics. The e-mails will be brief announcements covering breaking news from the Wildlife Commission and legislative updates related to commission activities. Links to more detailed information also will be provided when available.

Sign up for the wildlife advisories hotline by visiting the commission's Web site, www.ncwildlife.org. You will be asked to provide your name, current e-mail address and zip code. You also will have the opportunity to check subject-matter boxes (hunting, fishing, boating, nongame species, etc.) to customize the information the commission will e-mail to you.

For more information, call 919-773-2881, Ext. 300.

Catch Us at these *Numbers*

1-800-662-7137 to report violations of hunting and fishing laws
1-800-628-3773 (NC VESSEL) for boat registration and titling
1-800-675-0263 for hunting dates and shooting hours for migratory game birds
1-888-248-6834 (2HUNTFISH) to purchase most licenses with VISA or MasterCard using a touch-tone telephone
1-800-446-8663 (I GOT ONE) to report big game harvests
Connect to the Wildlife Commission's online Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $49,394,252.27

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

On Patrol

On opening day of turkey season last spring, wildlife Master Officer Garnie Britt was watching a bait pile in Burke County when he heard 10 shotgun blasts about 400 yards away. Moving in, Britt found a father and his 12-year-old son. Each said they had killed a single turkey, but neither could remember where in the woods they left it.

Other officers arrived, and they scoured the woods for about an hour before finding four dead gobblers beside a blind in a baited field. Fresh bootprints at the blind matched those of the father and son. On the way to the magistrate's office, the father's memory improved, and he confessed.

ILLUSTRATION BY JACKIE PITTMAN

N.C. WILD STORE

TWO for the road . . .

Travel far afield with a seasoned storyteller. Jim Dean's hunting and fishing stories evoke the reverie of wild places and the simple pleasures of rural life. Each of these two book-length collections represents some of his best writing, arranged to follow the course of a year outdoors.

DOGS THAT POINT, FISH THAT BITE
A collection of 50 essays originally published in Dean's "Natural Heritage" column for *Wildlife in North Carolina* magazine.
Hardbound ~~$19.95~~ $14.95 ITEM CODE **M8**
Paperback ~~$10.95~~ $8.00 ITEM CODE **M12**

THE SECRET LIVES OF FISHERMEN
Thirty-nine essays about life as a fisherman written for outdoor magazines.
Hardbound ~~$24.95~~ $18.50 ITEM CODE **M13**

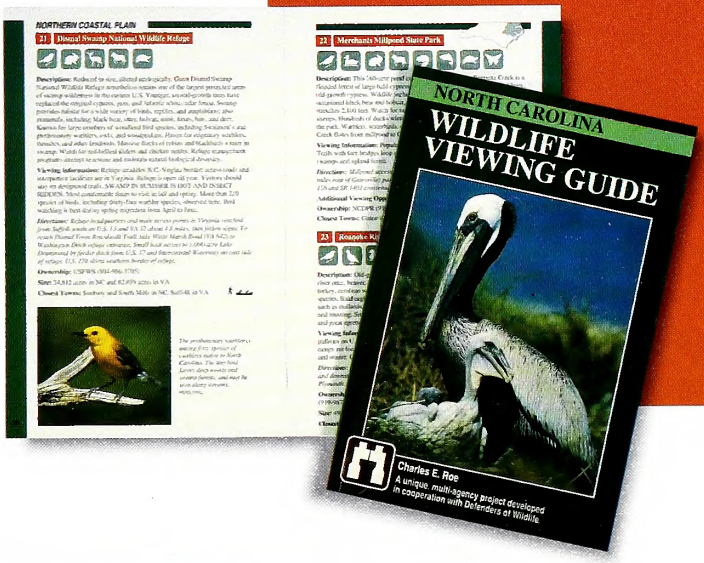
SET OF BOTH VOLUMES
With this special offer, you can add to your library and remember friends too.
Hardbound $30.00
ITEM CODE **M14**

"It's best to leave around 6:30 in the morning while it's still cool and the traffic is light. Head east and pick the back roads where you can drive 45 miles an hour or less without holding up a long line of traffic. Roll down the window and listen to the buzz of insects in the fields and ditches as you pass."

—The Secret Lives of Fishermen

Enjoy the VIEW

Wherever your travels lead, take along the *North Carolina Wildlife Viewing Guide*. Directions to 90 of the state's best locations for seeing wildlife include maps, observation tips and habitat notes. And if you're interested in a particular species, this guide tells you when and where it's most frequently seen.



NORTH CAROLINA WILDLIFE VIEWING GUIDE
$5.95 ITEM CODE **M6**

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a standout in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

left front design

left front design

Largemouth Bass. Add some history to your fishing trips with our bass tee. This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12XLG** (extra large)
A12LRG (large) **A12XXL** (extra extra large)

Snow Geese. Our waterfowl tee recalls times past, when the Cape Hatteras lighthouse stood close to Diamond Shoals. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front. Celebrate conservation efforts with this white, all-cotton tee.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

Wild Turkey. A timeless spring scene makes this tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo. Grab a gobbler with this tan, all-cotton tee.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

Sporting Dogs of North Carolina Poster Set

These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail their quarry and some that tree as well.
Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

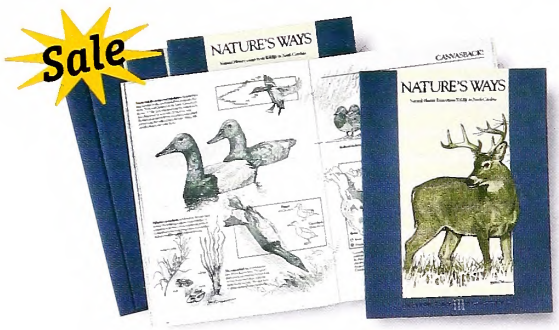
Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters

Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams.
Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**



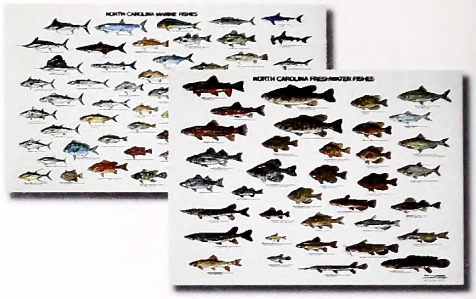
Nature's Ways Collection ▲

If you're looking for drama and science combined, "Nature's Ways" essays from *Wildlife in North Carolina* will deliver. Includes a new comprehensive index to all six volumes so you can find related essays easily.

Half-price while supplies last.

Boxed Set. $15 ITEM CODE **M10**

Unboxed set. $13.75 ITEM CODE **M9**



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**

Half-price while supplies last.

$5 ITEM CODE **E11**

Rivers of North Carolina ◀

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* published in Nov. 1999 chronicles the natural history of 17 major river basins in North Carolina. Travel from the Little Tennessee and the Hiwassee to the Roanoke and the Tar-Pamlico. It's a journey that will last a lifetime.

North Carolina WILD Places: A Closer Look ◀

Book and Posters Set.

Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a N.C. WILD Places map featuring the art of Jackie Pittman make this set a valuable teaching tool.

$16 ITEM CODE **E6**

Items not pictured:

All Things Are Connected

Video and Activity Guide. Based on Chief Seattle's 1855 speech, the film's focus is on environmental ethics. Accompanied by *This Land Is Sacred* teacher's guide, this film is a must-see for everyone. $22 ITEM CODE **W3**

Bird Houses and Feeders

This 8-page illustrated guide to building birdhouses includes construction notes and dimensions, as well as tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE **M6**

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE **M2**

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set.

$2 ITEM CODE **M5**

N.C. WILDlife Profiles Binder and Profiles Sets 1–12 ▲

This top-quality 3-ring binder includes:

- 120 illustrated fact sheets, each profiling an animal's history, status, habitat and behavior, and also containing a range map.
- Tab dividers that organize 12 sets of wildlife fact sheets by class.
- A table of contents, index and instruction sheet.

Half-price. $15 ITEM CODE **W17**

2002 Migratory Waterfowl Print and Stamp Set ▶

Dawn breaks, and a flock of pintails settles on the brackish waters of Pamlico Point. In the gray light, a father instructs his son to focus on just one bird before shooting. Signed by artist Ron Louque, "Traditions at Pamlico Point" will stir memories of a first hunt for many a waterfowler. Your purchase of this limited-edition set supports wetlands research and restoration. Overall size: 12" x 14"; image size 6 1/2" x 9".

This item not subject to 15% discount.

$145 ITEM CODE **DSP02**

WILDLIFE COMMISSION SPOTLIGHT

Women in the WILD

KEN TAYLOR

Becoming an Outdoors Woman (BOW) is a program designed to provide opportunities for women to learn skills that enhance and encourage participation in hunting, angling and other outdoor activities. Workshops may include a variety of hands-on instructional sessions in specialized areas such as fishing, hunter safety, target practice, archery, canoeing, motorboat safety, outdoor cooking and more.

Workshops are normally held at camp or outdoor conference facilities that provide lodging and meals for the participants. Registration is usually on a first-come, first-served basis, and all workshops require a fee.

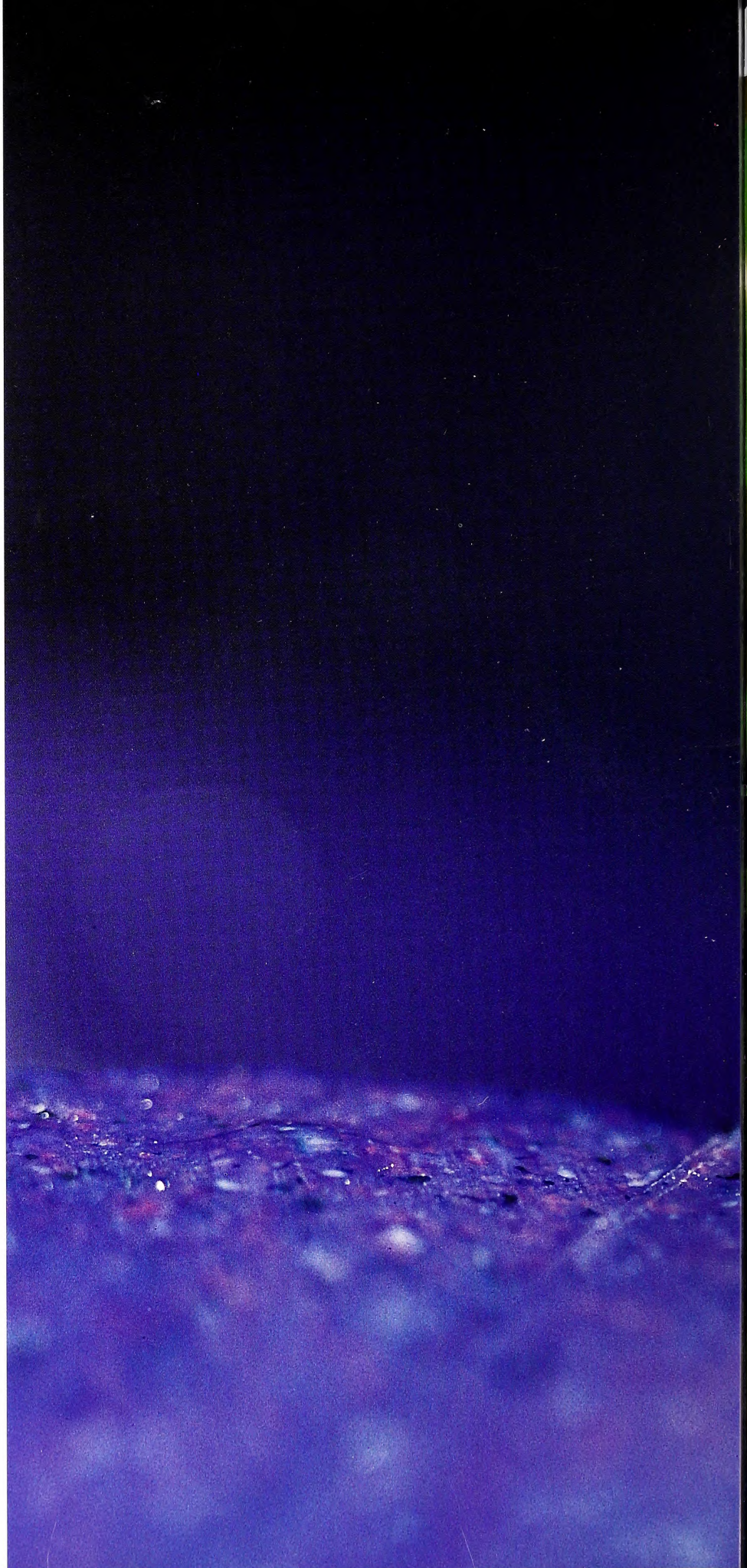
The beginner-level BOW workshop is a multi-day, overnight workshop with multiple sessions to introduce women ages 18 and up to the basics of particular outdoor skills. No formal training is required. To advance participants' knowledge, Beyond BOW workshops are more detailed and designed to expand knowledge and skills.

FOR MORE INFORMATION

call (919) 733-7123 Ext. 260. Upcoming workshops are posted on the Web site **www.ncwildlife.org**. Check under Education/Workshops.

KEN TAYLOR

KEN TAYLOR



Dainty Dragonfly

A newly-emerged eastern amberwing dries its wings in the warm spring air before setting off on its maiden flight. This species and many others can be observed on a paddle down the wild Roanoke River. The story begins on page 2.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

50% recycled,
30% post-consumer content

C45
7:67/5

WILDLIFE IN NORTH CAROLINA

MAY 2003 $1.50

N.C. DOCUMENTS
CLEARINGHOUSE

APR 30 2003

STATE LIBRARY OF NORTH CAROLINA
RALEIGH

A Johnboat Named Desire

by Jim Dean

JIM DEAN

It does not seem so long ago that I could carry all my fishing tackle in one hand. I had a noodly glass spinning rod and a closed-face Shakespeare reel given to me by my grandfather. My casting rod was a hand-me-down, 5½-foot, solid-glass True Temper with a Penn level-wind reel. The rest of my tackle fit the same scenario. It was all I could afford, but it got the job done.

Early on, I realized that the biggest limiting factor I faced was the lack of a boat and a means to transport it. Some of my friends had boats, but when I fished alone I was restricted to walking the banks or renting some sodden millpond scow that leaked like a colander and threatened to tip me out every time I shifted my chewing gum.

A large boat was beyond my means, but I had inherited a system of propulsion—two old wooden paddles—and some accessories that included a bailing tin, a World War II kapok life preserver and an anchor consisting of a window sash weight tied to a rope. I first considered a canoe because these lovely craft are traditional, lightweight, carry heavy loads and are seaworthy far beyond their size. But canoes aren't well suited for motors, tackle storage or the addition of comfortable swivel seats with backs.

Eventually, I chose a graceless 12-foot aluminum johnboat, and added a rooftop boat rack to my ancient, thirdhand Maverick. For the first time, I could fish virtually anywhere, and I have truly never felt a greater sense of freedom or wealth. Someday, I figured I'd buy the perfect boat, but the truth is that I was closer to perfection than I knew.

I've gone through several bigger boats since then, but I still have that basic 12-foot johnboat, and it has proven indispensable. I've used it—and others like it—for more than 30 years to fish farm ponds and lakes, Piedmont creeks and coastal blackwater rivers, even (weather permitting) the sheltered edges of brackish bays and saltwater sounds. I've pulled johnboats through the woods to launch in inaccessible spots, slid them down steep embankments and portaged them around logjams and waterfalls. At busy ramps, while owners of big bass boats waited impatiently, I have pulled up to the bank and dragged the boat and all my gear to the car.

"The truth is that I was closer to perfection than I knew."

Johnboats in the 8- to 10-foot range are best suited for solitary anglers, but a 12-footer is roomy enough to comfortably carry two fishermen and all their gear. Most are light enough (at 85 to 120 pounds) to be car-topped, slid into the bed of a pickup and manhandled virtually anywhere easily by a single adult.

I own two of these wonderfully ugly boats. One is reserved for use on ponds or where I need maximum portability. To reduce weight, I've added only a pair of removable seats, and I power the trolling motor with a small, lightweight 12-volt compact car battery rather than a heavier marine battery. I can use the battery on several half-day trips before I have to recharge it.

My other 12-footer is rigged out as a mini-bass boat. It has swivel seats with folding backs for comfort, a more powerful electric trolling motor, a 7½-horsepower outboard, portable depth-sounder, remote anchor control and other conveniences, but it's still easy to manage because I haul it on a small trailer. Given the way I use this boat, it might make more sense if it were a 14-footer, especially since I have the other 12-footer for ponds.

One thing I've discovered is that these smaller boats seem to have improved my fishing success. I can launch one of my 12-footers just about anywhere without having to look for a concrete ramp. This has opened the door to some fantastic fishing off the beaten track on small creeks, rivers, ponds and undeveloped lakes.

I think there are even advantages when fishing bigger water. Because I can't race over open water looking for honey holes, I limit my fishing to smaller areas. When fishing big Piedmont lakes for bass, I can usually find prime bass structure not far from the launch site. Instead of riding, I'm fishing, and I often catch bass in places other fishermen routinely pass up.

Think about this. For the price of one 200-horsepower, stream-lined, candy-flaked bass boat fully equipped with every electronic marvel, you could buy half a dozen johnboats in various sizes and rig them out to fit precisely the kind of fishing you like best.

Of course, I suppose you could have said the same about my old Maverick. I once figured I could own 35 used Mavericks for the cost of a single new BMW, but that's another story.

Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

May 2003 *Volume 67, Number 5*

Features

page 14

2 When the Woods Come Alive
written by T. Edward Nickens
Good wildlife watchers are made, not born. Here are tips to help you train your senses to see more of what you're in the woods for.

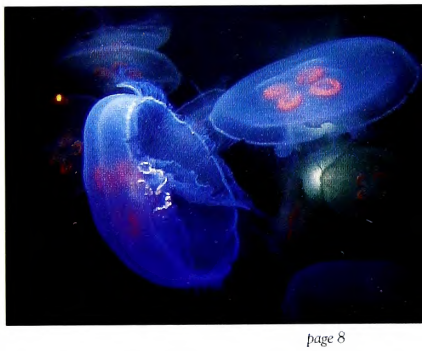
8 Water Worlds *written by Ida Phillips Lynch*
photographed by Jody Duggins
North Carolina's aquariums offer undersea adventure, even for those who can't swim.

14 Five Days on the AT *written by Rodney Foushee*
photographed by Jody Duggins
Hiked for all reasons and in all seasons, the Appalachian Trail provides solace and adventure for wayward souls as it passes through North Carolina.

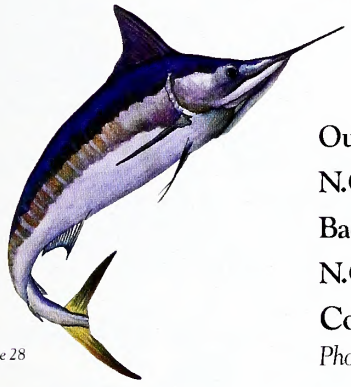
22 The Amazing Shellcracker
written and photographed by F. Eugene Hester
Called both shellcracker and redear sunfish, this feisty species is as interesting as it is an excellent quarry for anglers of all ages.

26 Threat of Chronic Wasting Disease Spurs Action
written by Kate Pipkin
Proposed rules to prohibit the transportation of captive deer and elk are the surest means to stop the arrival of Chronic Wasting Disease.

page 22



page 8



page 28

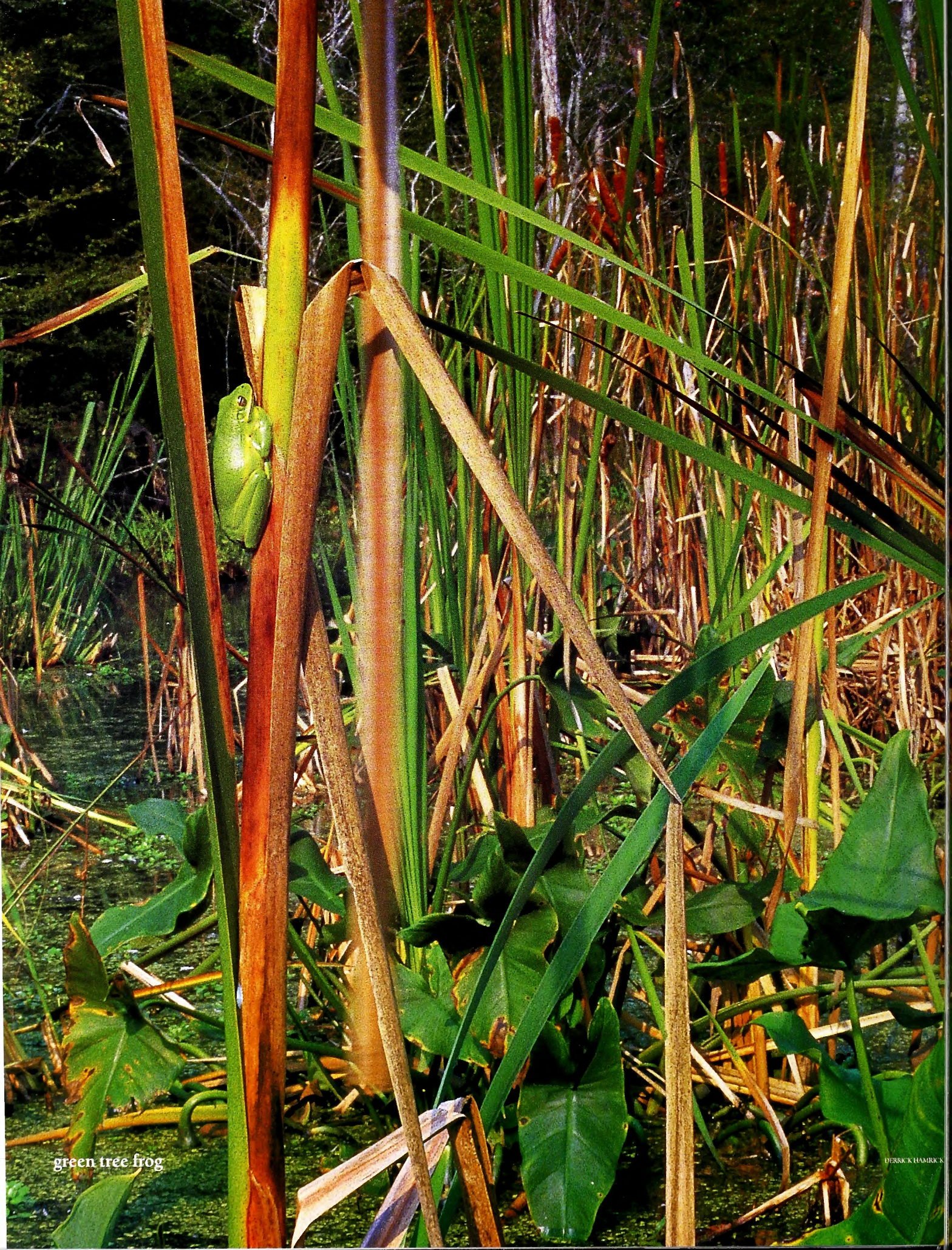
Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Jeff Beane* 28
Back Porch *by Brad Deen* 32
N.C. WILD Store 37

Cover *A katydid blends in nearly perfectly on a blade of grass. Photograph by Derrick Hamrick.*

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $7.50, three years $20, lifetime $100. All foreign subscriptions are $23.50 per year. For subscriptions from foreign countries, payment only by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.



green tree frog

DERRICK HAMRICK

when the woods come alive

written by T. Edward Nickens

BILL LEA

Good wildlife watchers are made, not born. Here are tips to help you train your senses to see more of what you're in the woods for.

I was lagging far behind my trailmates as we crunched up Brushy Mountain Trail in the Great Smokies, but I hardly noticed, lost in the metronomic cadence of hustling up a steady grade. Then a flash of orange interrupted my internal reverie. I snapped my head up, eyes on the greening spring canopy, searching for the bird that boasted such brilliant plumage. I knew where to look because I knew that many spring-migrating birds glean new leaves for inchworms. But no matter how hard I searched, I saw nothing but a jumble of green.

That's when I changed how I was looking and shifted my ocular gears into "splatter vision" mode. I purposefully allowed my vision to go soft focus, blurring the details of the leaves and branches overhead. It's a technique used by American Indians and espoused by famed naturalist Tom Brown in his seminal *Field Guide to Nature Observation and Tracking*. "Everything in your 'viewfinder' is a little fuzzy because your eyes are not focused," Brown writes, "but they are much more sensitive to movement. To identify a movement, all you have to do is focus on it."

There, to the right, a flicker of movement in a gnarly old hemlock. In an instant, I changed my focus from soft to fixed and zoomed in on the area that quite literally "caught my eye." For a brief few seconds, I watched the first Blackburnian warbler I'd ever seen, and I remember its fire-orange breast and neck with more clarity than that of the vista from atop Brushy Mountain.

When most folks say they want to watch wildlife, what they really want is to see battling white-tailed bucks or river otters sliding down a muddy bank—a Wild Kingdom moment, in other words. But most wild animals rarely sashay up and conveniently pose for your viewing pleasure. To see wildlife consistently, especially when you're away from parks and scenic drives where creatures are habituated to human presence, you need to tune your senses to animal behavior and then train your brain to override the normal "tunnel vision" way of looking at the natural world.

Perhaps the best time to watch wildlife is during the breeding seasons, spring and fall. But many of us are outdoors in the comparative doldrums of summer, when most animals scale their daytime travels way back to limit energy expenditures during the heat of day. That's when you'll really need to sharpen your senses, for finding wildlife becomes a more difficult proposition. Instead of looking for love, animals are searching for shade and water and resting up after the exhausting duties of breeding and rearing young. That makes summer the perfect time to work on another visual technique to find wildlife, a technique I call "antlers and elbows."

In a way, this is the opposite of splatter vision. Antlers and elbows involves looking for parts of an animal rather than the whole, and it's particularly effective when foliage obscures wildlife from view. It's deceptively simple: Narrow your field of view and concentrate on a single square foot of habitat. Perhaps it's a thicket that looks like it might hold a whitetail deer, or a pine tree hiding a fox squirrel. Study each shape and texture; force your eyes to hold steady and burrow through holes in the cover. Don't look for a deer or a rabbit—look for the whitish glint of an antler tine, a rabbit's liquid brown eye. The first time you

try this, you will be surprised at how difficult it is to study a tree for three full minutes. Search each junction of trunk and branch for the fringe of a squirrel's tail; study each knothole for a pair of dark spots staring back at you. Look for antlers and elbows, not bears and deer. You'll soon be seeing more of both.

Splatter vision and antlers and elbows are just two techniques you can use to greatly enhance your chances of viewing wildlife while afield. Here are more:

Practice splatter vision

Lie down in a patch of trees with a clear understory. Look up, then relax your eyes and let the leaves go fuzzy. Soon your brain will pick out tiny movements. Focus on each movement long enough to identify it, then dial back the focus. Once you get the hang of it, extend your awareness to the very edges of the sight picture, without moving your eyes.

Climb a tree

Nothing increases your wildlife sightings as much as scaling 8 to 12 feet into a tree that's near animal trails, meadow edges or berry patches. Your field of vision will be vastly improved, your scent will drift above animals' noses, and any movements you make are less likely to be detected by animals and send them running for cover.

Open your mind

Too often we visit wild places with a particular image in mind—a deer slipping through oak woods, ducks on the marsh edge, a particular warbler. If you're looking for a bear, you might miss the bobcat holding steady just off the trail, waiting for you to pass. If scoring more wildlife sightings is your quest, empty your mind. Be open for anything, and let no movement go unexamined.

Turn to stone

You can't do this if you're thrashing through the woods hell-bent to bag the next peak before your trail pals. To see more wildlife, you have to stop moving. A human being walking in a natural landscape is the sensory equivalent of throwing a stone into a quiet pond. Sound, scent and movement ripple in all directions, creating what wildlife tracker and author Paul Rezendes terms a "periphery of disturbance" inside which any critter more perceptive than a beetle will know there's an intruder in town. Stop for five minutes, and the sensory ripples will dissipate enough so that disturbed animals might continue their activity and alert you to their presence. Stop for 15 minutes or more, and animals too far away to have been disturbed initially might move into your field of vision.

BILL LEA

Walking quietly in the woods is a skill anyone can learn, but it takes practice. Take three S-L-O-W steps, then stop. Look and listen—not for five seconds, but for five minutes. Stay in the shadows as much as possible, and use trees, rocks and foliage to break up your silhouette. How slow is slow enough? Maybe 20 to 30 seconds per step.

Slow down every movement

It sounds simple, but staying still is difficult work. While learning to bowhunt, I learned what true stillness meant: eliminating

DERRICK HAMRICK

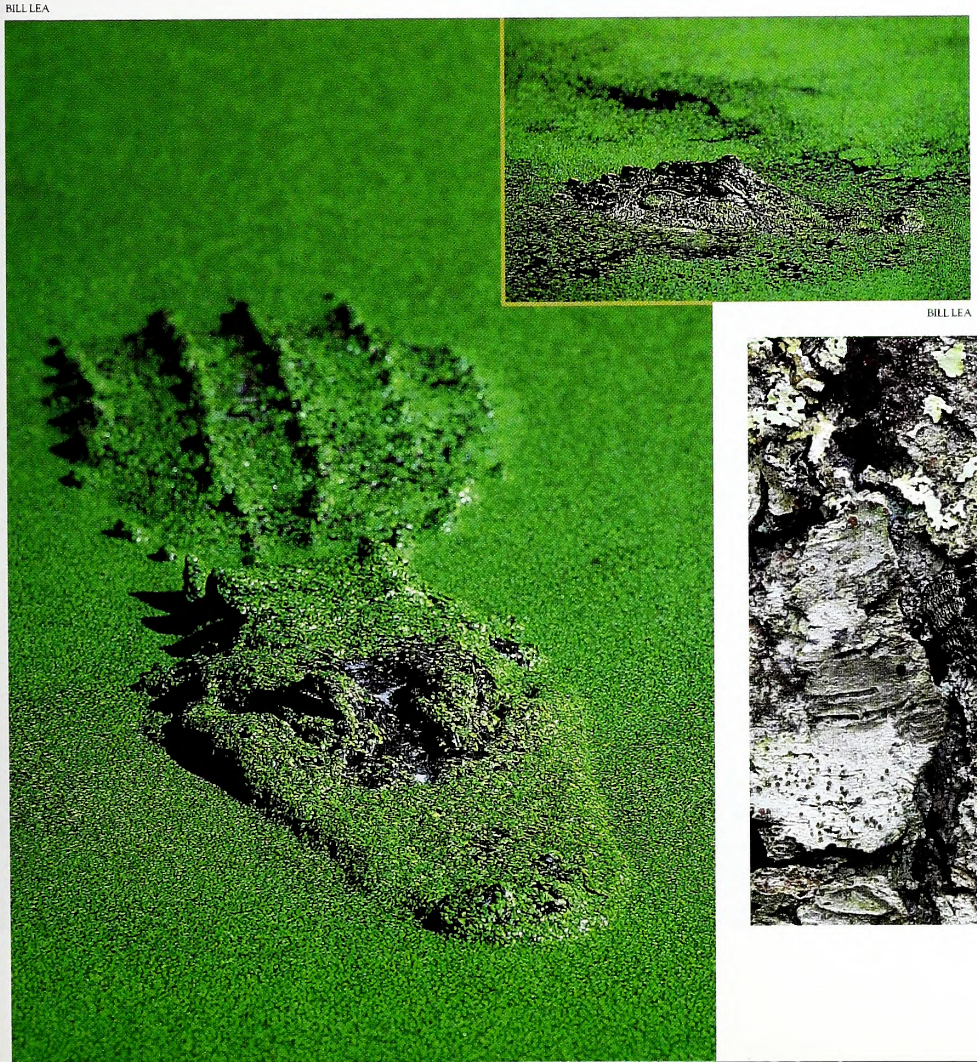
DERRICK HAMRICK

Can You Spot the Wildlife in Each of these Photos?

Often, locating wildlife is as simple as noticing an animal that is right in front of you. A praying mantis (facing page) resembles a stalk of vegetation; a crab spider blends in with a black-eyed Susan; an alligator (below, left) appears to be a floating log, and a moth (below, right) looks like a piece of bark. An eastern fence lizard (top), meanwhile, blends into some leaves while an American bittern (below) gets lost in the reeds and a black bear hides in a culvert.

BILL LEA

BILL LEA

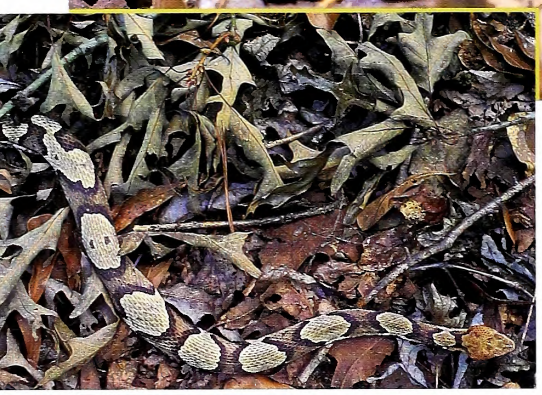


BILL LEA

DERRICK HAMRICK

BILL LEA

DERRICK HAMRICK



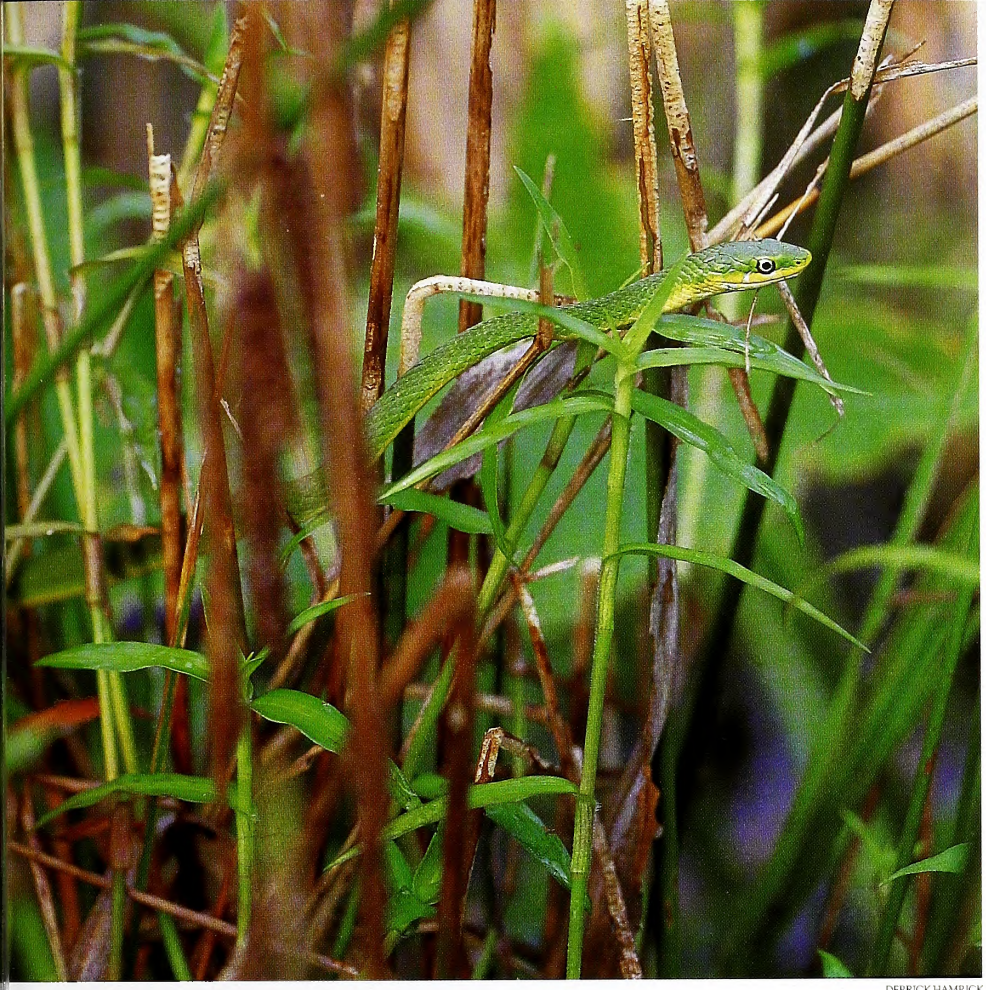
DERRICK HAMRICK

DERRICK HAMRICK

BILL LEA

Often, the wildlife you are trying to see has spotted you long ago: Note the bobcat (left), the yellow-shafted flicker (far left) and the white-tailed buck (right). The eastern copperhead (above, left), the rough green snake (above) and the blue crab are masters of blending in. To become a successful wildlife watcher, you must become less noticeable yourself by using camouflage and, in some cases, scent control.

Ever Feel Like You're the One Being Watched?



DERRICK HAMRICK

BILL LEA

all unnecessary movements and slowing all necessary movements to ultra-low speed. Itchy ears go unscratched. Biting bugs bite away, unslapped. I take a good 45 seconds or more to bring my binoculars from my chest to my eyes to check out a movement in the woods. The payoff is amazing: bobcats scratching on the tree trunk below; broods of quail feeding less than 10 feet away. Once, a squirrel descending the tree in which I perched put its front paw on my shoulder.

Get spotted

Scoff if you like, ye of the fuchsia Supplex breed, but pulling on a camouflage coverup will help you melt into the forest. If you're in a heavily hunted area, consider one of the "blaze camo" patterns of alternating hues of orange readily seen by humans but still relatively invisible to animals with poor color vision. If you'd rather not wear camouflage, match the overall hues of your clothing to the season. Before leaf-out in early spring, pull on brown and gray pants and shirts, shifting to shades of green in summer.

Don't pitch a stink

Most mammals use scent detection as their first line of defense, and those with the sharpest sniffers can smell a human a mile or more away. Be ever aware of wind direction, and travel with the breeze in your face if you can, or at least into a crossing wind. Even in calm air, scent travels a great distance. Warming air rises in the morning and cool air drifts down during the evening, and prey animals have learned to descend with their scent in the afternoons and climb to higher ground during the day. Position yourself to intercept.

It's the habitat, stupid

No matter how attuned your senses or benign your B.O., if you concentrate your efforts on where the animals aren't, you're wasting time. Try to find "edge habitat," those zones where two different kinds of habitat come together. The most obvious, of course, is a field or meadow abutting woodlands, but other edge habitats are also animal magnets: the edge between second-growth forest and mature timber; the transition zone where a marsh gives way to uplands; or the edge where a pine forest meets a grove of hardwoods. In the fall, especially, white-tailed deer bucks travel interior edge habitat, patrolling their breeding areas.

Go horizontal

Most vegetative structure is vertically oriented, so train your brain to pick out horizontal lines in your sight picture. These might turn out to be blown-down trees, true, but they could be a buck's back.

Take it lying down

Just as climbing markedly improves your sight picture, getting a fawn's-eye-view of the world will open new windows on the woods. Lie on your belly and look through the trees, imagining that you're a fox or bobcat. This is a great opportunity to use splatter vision and antlers and elbows to process the images.

Seek out siesta spots

When midday temperatures soar in summer, many animals will bed down in dense cover, especially that found on north slopes. Locate such cover near a water source and you'll likely find a well-traveled path in between. Be nearby in the last hour of daylight, and you'll have a good chance of spotting deer.

Eventually, you'll discover that finding animals in the wild has as much to do with insight as with eyesight. And you'll learn to do more than simply keep your eyes peeled.

WATER WORLDS

North Carolina's aquariums offer undersea adventure, even for those who can't swim.

WRITTEN BY
Ida Phillips Lynch

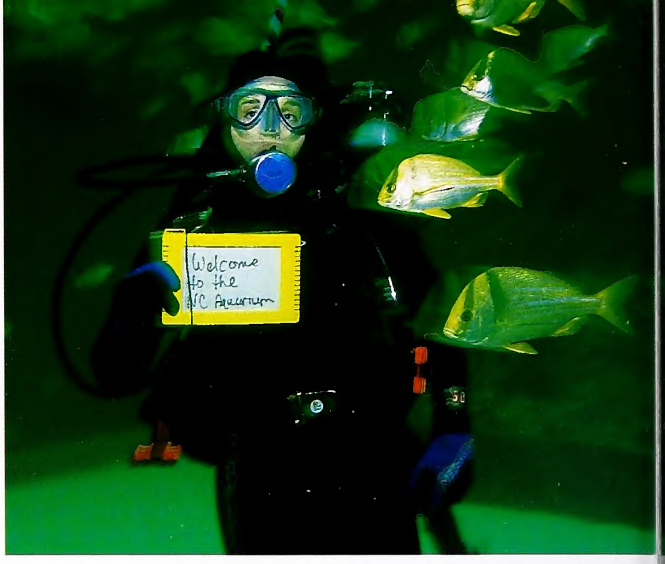
PHOTOGRAPHED BY
Jody Duggins

A waterlogged state, North Carolina contains one of the world's most extensive barrier island systems and diverse wetland and aquatic habitats, ranging from bottomland swamps to salt marshes. Yet many North Carolinians will never venture into these soggy places, lacking the interest or means to paddle a blackwater stream or dive into the deep, blue Atlantic. So how do marine conservationists help landlubbers develop an appreciation for the state's aquatic and marine habitats? North Carolina's state aquariums are part of the answer.

In 1993, the N.C. General Assembly approved renovations to the state's three aquariums—at Roanoke Island, Pine Knoll Shores and Fort Fisher—for a cost of $53 million. To date, the General Assembly has allocated $46 million, and the N.C. Aquarium Society, a nonprofit support organization, has raised an additional $6 million for the remodeling. After two years of construction, the Roanoke Island facility reopened in March 2000, and the aquarium at Fort Fisher reopened in March 2002. (The Pine Knoll Shores expansion has been delayed, since some funds earmarked for its refurbishment were transferred to the Hurricane Floyd disaster relief effort.) These living laboratories now boast more staff, expanded outreach programs and innovative exhibits that help visitors understand how North Carolina's isolated barrier islands and offshore habitats are inextricably linked to the mainland.

Like aliens from outer space, moon jellyfish pulse through an aquarium at Fort Fisher. But the biggest draw at all three state aquariums is the sharks (facing page).

A diver instructs an audience from inside one of the tanks at the North Carolina Aquarium at Roanoke Island. Visitors can also tour outside interpretive displays covering a variety of freshwater habitats (below, right).



ROANOKE ISLAND

The Alligator River's journey is depicted with exhibits that flow from the river's Coastal Plain headwaters at New Lake into the Albemarle Sound and eventually the Atlantic Ocean. Located three miles north of Manteo on the shores of Croatan Sound, the 68,000-square-foot aquarium focuses on "Waters of the Outer Banks."

On my first visit to the aquarium, I wandered into the "Wetlands on the Edge" exhibit, a sunlit atrium that represents the transitional wetland habitats found where rivers flow into Albemarle Sound. A speaker broadcasting high-pitched grunts and squeaks provided an audio accompaniment to a tank in which a dozen entangled American alligators basked in the warmth of a sunlamp. Bald cypress draped in Spanish moss added to the swampy flavor of the room. It was home to brightly colored painted turtles and yellowbelly sliders, as well as river otters (reportedly some of the most popular aquarium inhabitants).

Walking into the "Marine Communities" exhibit, I was immediately drawn to a tank housing delicate sea horses. Tails wrapped tightly around seagrass fronds, the aquatic equines swayed in the gentle current. The sea horse is just one of many curious aquarium residents that inhabit North Carolina's offshore waters but are never seen by most beachgoers. "All of the species that we have on permanent display, in all three aquariums, are native or seasonal visitors to North Carolina waters," said Terri Kirby Hathaway, education curator at Roanoke Island. "Temporary exhibits give us a chance to go outside the state's boundaries to exhibit other species."

The aquarium's centerpiece is the new 285,000-gallon "Graveyard of the Atlantic" exhibit, the state's largest ocean tank. Named for the infamous shoals that have claimed countless vessels off the Outer Banks, the tank contains a one-third-scale model of the *USS Monitor*, a Civil War ironclad that sank in a storm off Cape Hatteras in 1862. The wreck became the nation's first marine sanctuary in 1975, but its resting place 16 miles from the mainland in 230 feet of water makes the fragile *Monitor* inaccessible to most divers. The aquarium's replica provides a home for reef fish while offering visitors insight into the history-rich wreck.

"We wanted some structure in the open-ocean tank that would represent a unique aspect of our area, and the *Monitor* seemed the most likely candidate," Hathaway said. "It's unique to the 'Graveyard of the Atlantic.' You won't find the *Monitor* shipwreck on display anywhere else, other than artifacts on display at the Mariners Museum in Newport News. It helps us teach people about artificial reefs and biofouling. And as an artifact of the Civil War, it's also a link to our cultural heritage."

I watched a shark with a mouth full of protruding, needlelike teeth swim through schools of patrolling cobia and grouper. A wall panel explained: "The sand tiger shark presents a fearsome, snaggle-toothed face to the world. They are actually quite sluggish, and there are few documented attacks on people."

"The five sharks in our aquarium are a big draw," said Daryl Law, public relations coordinator with the Roanoke Island aquarium. Twice a day, aquarium visitors thrill at the sight of divers who venture into the "Graveyard" and converse with visitors via underwater microphones. "People always ask the divers: 'Do the sharks bother you, or are you scared to go into the tank?'" Hathaway said. "There have been no negative interactions between the sharks and our divers, and we have divers in the tank at least two times a day. But we always talk about the

fact that every time you enter the ocean, you are entering the shark's environment."

The dive is not a daredevil stunt, but an educational program intended to dispel some of the myths about sharks. "Our divers go into the tank every day to show people that these sharks are not really interested in humans," said Law. "Sharks are really misunderstood. They feed primarily on sick and injured animals in the ocean."

The aquarium staff works to create educational opportunities in every aspect of caring for marine animals. "Our educational mission is to promote the awareness, understanding, appreciation and conservation of North Carolina's aquatic resources," Hathaway said. "A lot of aquariums, including North Carolina's, offer school programming. But the majority of our programs are public programs, and that's one thing that makes North Carolina different."

All three aquariums offer public programs that appeal to many different age groups and interests. "'Breakfast With the Rays' is one of our most popular programs," Hathaway said. "Groups come in before the aquarium opens and participate in an educational program about stingrays. They help us feed the stingrays, and then we provide them with their own breakfast of people food! During the offseason in the winter, we also offer a seafood series with different chefs from around Dare County. Participants learn about the life history of a particular fish, and then the chef shows them how to clean and cook the fish."

Students from all over the state also travel to the aquariums to participate in school programs that are free to preregistered groups. The programs are structured around the North Carolina school curriculum for kindergarten through high school and range from sea turtle programs for early grades to a high school "Ocean Pharmacy" program that focuses on biomedical research. In 2002, school groups from 71 of the state's 100 counties traveled to the aquarium on Roanoke Island. All told, 320,000 people visited the aquarium in 2002.

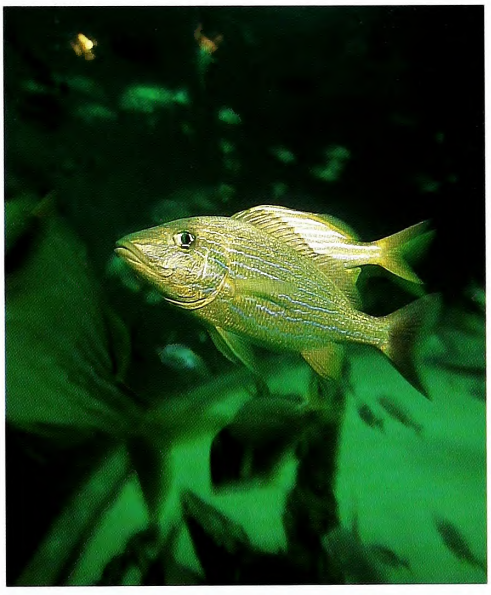
An 18-year employee of the aquarium, Hathaway believes that the new exhibits help illustrate natural connections that people often overlook. "I think some people that visit the Outer Banks don't realize that all these habitats—the rivers, marshes, bays and barrier islands—are interconnected," she said. "The new aquarium enables us to show how all these things work together to make the Outer Banks."

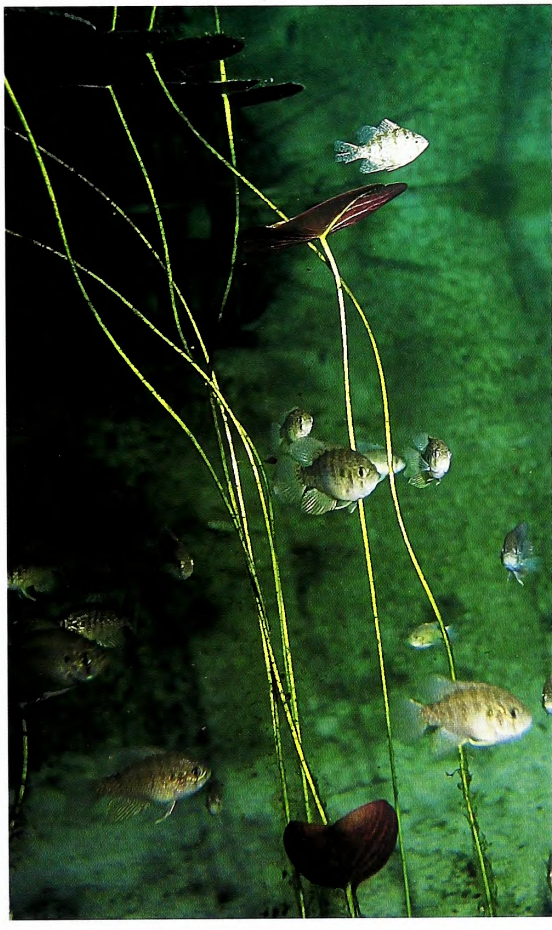
FORT FISHER

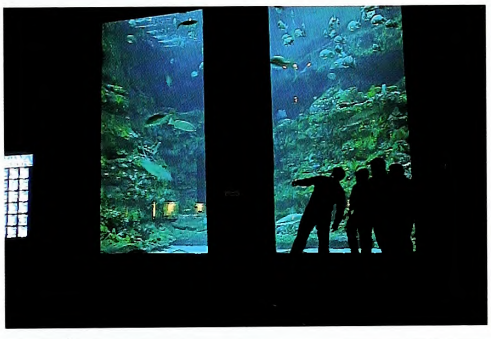
Located near the mouth of the Cape Fear River just past Kure Beach, the Fort Fisher aquarium illuminates the connections between rivers and marine communities. The facility has tripled in size to 84,000 square feet, and its new exhibits mirror the voyage of the Cape Fear as it journeys from its headwaters in the Piedmont through Coastal Plain swamps and eventually empties into the Atlantic Ocean.

Like most visitors, I began my tour in the Cape Fear Conservatory, a half-acre atrium that replicates the transitional region at

A multitude of tropical fish species, including porkfish (left) and jack crevalle (bottom), swim in large tanks at each aquarium, providing possibly the only close encounter many visitors will ever have with these offshore species. Bluegills (below) are found in a variety of freshwater habitats across North Carolina and can also be viewed at the Fort Fisher aquarium.







N.C. Aquariums

For up-to-date news, program schedules for each aquarium and marine-related resources, visit the N.C. Aquarium Web site at www.ncaquariums.com.

All the aquariums offer free admission to Aquarium Society members, members of AZA (Association of Zoos and Aquariums), children under 6 and registered school groups. The aquariums house tax-free gift shops, classrooms, auditoriums and changing exhibit galleries.

The aquariums are open from 9 a.m. to 5 p.m. daily.

School Programs

Visit the aquarium Web site for detailed information about school programs. Reservations for all school visits to the aquariums are required and should be made at least two weeks prior to the visit. To schedule a visit, contact the individual aquarium. Reservations may be made by phone, fax or mail.

N.C. Aquarium Society

The North Carolina Aquarium Society is the support organization for the three aquariums. A membership-based, nonprofit organization, the society raises funds for the aquariums through private donations, corporate gifts and foundation grants. Profits from society memberships and aquarium gift shops also provide support for many aquarium programs and services. Members receive free admission to North Carolina aquariums, the North Carolina Zoo and more than 150 other zoos and aquariums.

Memberships start at $25 for individuals and $40 for families.

For more information or to join, call 1-800-832-FISH (3474), or write to N.C. Aquarium Society, 417 N. Blount St., Raleigh, NC 27601.

Fort Fisher (910) 458-8257
900 Loggerhead Road . Kure Beach, NC 28449
Admission fees: Adults: $6 . Seniors and military: $5 . Ages 6-17: $4

Pine Knoll Shores (252) 247-4003
PO Box 580 . Atlantic Beach, NC 28512-0580
Admission fees: Adults: $4 . Seniors and military: $3 . Ages 6-17: $2

Roanoke Island (252) 473-3493
P.O. Box 967 . Airport Road . Manteo, NC 27954-0967
Admission fees: Adults: $6 . Seniors and military: $5 . Ages 6-17: $4

Raven Rock where the Cape Fear flows from the rolling Piedmont into the Coastal Plain lowlands. The conservatory is designed to show "the world beneath the surface," said Peggy Sloan, education curator at the aquarium. "Live plants, mist and sunlight streaming through the windows create an immersion experience, introducing visitors to the Cape Fear River basin."

I walked around the living exhibits that depict the wild lands along the river's upper reaches, such as a Carolina bay with live insect-eating Venus's flytraps and pitcher plants. Frogs and newts bobbed in nearby tanks, illustrating the bays' role as amphibian breeding habitats. In the Roan Island exhibit, a representation of the swampy upland that marks the junction of the Cape Fear and Black rivers, bald cypress and bay trees loomed over a tank filled with freshwater fish, such as redfin pickerel and redear sunfish. The exhibit is not just lifelike; it is alive: I watched a green anole scamper up a tree branch and freeze, slowly turning a dusky brown shade to blend in with its perch.

In the adjoining building, I entered the "Coastal Waters" exhibit, where the Coquina Outcrop touch tank enables people literally to get a grip on the odd (but nonstinging) creatures that inhabit the shoreline, such as horseshoe crabs and sea stars. The tank contains a replica of the coquina outcrop at Fort Fisher, the only rock outcropping on the North Carolina coast. Volunteers dip crabs out of the tank and place them in plastic containers so that children can cautiously touch the creatures' colorful carapaces.

The aquarium's centerpiece is the 235,000-gallon "Cape Fear Shoals" saltwater tank, which showcases the hard-bottom reef habitat. "The bottom of the shoreline along the North Carolina coast is typically sandy," said Bob Roush, public relations coordinator at the aquarium. "But about 10 miles offshore and in isolated

places beyond that, you find these hard-bottom reefs. They're rocky, vertical habitats that are almost like canyons. They have all kinds of surfaces where sponges and corals can get a foothold and build a foundation for a strong interconnected habitat. That's where you find the greatest concentration of fishes."

The tank houses 500 creatures representing about 50 species, including sharks, sea turtles, eels and reef and ocean fish. Looking through one of five viewing windows that surround the exhibit, I watched two divers clean the lifelike coral display in the 24-foot-deep tank. Sharks, fish and skates swam around the tank, seemingly oblivious to the humans. A curious queen triggerfish repeatedly swam to the glass, rolled over and floated away. Stingrays slid over the window, exposing their white underbellies. A green moray eel poked its formidable head from behind a rock at the bottom of the tank. Visiting children peppered their parents with questions: Do fish sleep with their eyes open? Why are there people in there?

Although the exhibits and informational panels offer casual visitors an educational experience, many visitors opt for staff-guided programs. The aquarium offers aquarium-based programs, such as behind-the-scenes tours, as well as field trips. "Our field classes offer an introduction to the environment surrounding the aquarium," said Sloan. "The instruction is geared toward all ages and includes a walk in the marsh, seine netting and crabbing." Some of the popular outings include canoe trips in nearby Zeke's Island Estuarine Reserve and beginning surf fishing and surfing workshops.

Like the other aquariums, Fort Fisher provides free programs for school groups. "We saw approximately 75,000 school kids in 2002," said Sloan. "Many opt for a salt marsh exploration, a reptile program or some other more intimate and in-depth experience." Annual visitation to the aquarium has almost doubled since it reopened in 2002, and Roush estimates that 600,000 people will visit the aquarium in the first 12 months. As with the other facilities, attendance peaks in the summer months, from Memorial Day to Labor Day.

PINE KNOLL SHORES

Located within the Theodore Roosevelt Natural Area, a 298-acre maritime forest near Atlantic Beach, the aquarium at Pine Knoll Shores offers diverse exhibits, nature trails and educational programs. The aquarium's expansion was delayed in 1999 when funds earmarked for the renovation were redirected to disaster relief efforts stemming from Hurricane Floyd. The aquarium staff and the Aquarium Society are now working together to pursue an alternative funding strategy and "are optimistic that we're going to be able to launch the renovation soon," said Jay Barnes, director of the aquarium. He also notes that "aquarium visitors can help us reach this goal. Admission fees are a key part of the equation, as these fees help support the renovation." Current plans call for the new aquarium to interpret North Carolina's diverse aquatic life from the mountains to the coast. Stay tuned for future developments. ⊠

American alligators, both large and small, are big hits at all three aquariums. Meanwhile, Ben Wunderly, an educator at the North Carolina Aquarium at Pine Knoll Shores (top), gives a talk about sea turtles for a group of students. Jay Barnes (bottom) is director of the Pine Knoll Shores aquarium.

5 days on the AT

written by Rodney Foushee ◆ photographed by Jody Duggins

Hiked for all reasons and in all seasons, the Appalachian Trail provides solace and adventure for wayward souls as it passes through North Carolina.

Day 1 Spring has yet to fully arrive in the high mountains this late April morning as we wind our way slowly up the dead-end gravel road to Deep Gap. The beech trees along the steep slopes still carry last year's leaves—tan and tattered—but green replacements are on their way. Still, the sun, piercing down into the Nantahalas, makes for a seemingly pleasant start to our trip. It's been a one-way car ride up—for the most part this morning—from Wesser to this remote section of the Blue Ridge in Macon County. The U.S. Forest Service road comes to an abrupt halt at a small clearing with an old picnic table and a couple of brown, metal, bear-proof garbage bins. This is the end of the proverbial line for Jody and me. We'll be hoofing it on foot back north to Wesser in a circuitous route covering 60-odd miles along the crooked spine of the Appalachians.

"This is going to be interesting," I tell Jody as we watch the Chevy SUV make the wide circle in the clearing and begin to creep back downhill and out of sight—its tires popping in the loose gravel—on its way back to civilization. This is the entrance to the 24,000-acre Southern Nantahala Wilderness Area. A smallish, rectangular white blaze on a hickory tree affirms that we are on the right trail. With little ceremony, we hoist our heavy packs over our shoulders and begin an uphill climb with the sun in our faces.

It may cover a distance of more than 2,100 miles from Georgia to Maine, but at 3 feet wide in many places, the Appalachian Trail is more of a goat path than an expressway. This stretch of the AT is no exception, I realize, as I lean against a frail dogwood on the trail to catch my breath 20 minutes into the hike. My heart has been pounding out of my chest since nearly the first step from the drop-off point, and the nylon straps of my pack are starting to bite into my shoulders. I heave the 50-pound pack up in the air to give my back a momentary break from the load and look back to notice Jody also is huffing and puffing. With several pounds of additional weight in camera equipment over my own load, he is feeling the incline as well. The fact that we've both been jogging religiously in preparation for this exercise seems to no avail. We are quickly learning—the hard way—that the only thing that prepares you for hiking the AT is the AT.

Temperatures climb into the high 70s as we continue the arduous 2.5-mile climb to Standing Indian Mountain—the first point on the Appalachian Trail going north that exceeds a mile elevation: 5,498 feet to be exact, but who's counting? Along the way, I take notice of the stumps of ancient American chestnuts, victims of the chestnut blight back in the '30s. The trees once provided a rich protein source for the wild inhabitants of the forest.

At a creekhead, I first notice the trilliums—acres of beautiful, full white flowers with lush green foliage. Their spreading simple leaves bathe in the moist mist.

We skip the summit of Standing Indian and press onward for Carter Gap, where we plan to stay at one of the infamous trail shelters our first night. We head through alternating laurel thickets and rocky openings leading to a heath bald, shrouded in fog and covered with shrubs including mountain laurel and rhododendron, high-bush blueberries and flame azaleas. It is here that we make one of our few up-close encounters with actual wildlife on the trail—an Appalachian cottontail sits motionless amid a tangle of briers in a tiny clearing at the edge of the trail. Jody and I approach within touching distance of the short-eared rabbit. The rabbit's

Three feet wide *in many places, the Appalachian Trail covers more than 2,100 miles of rugged terrain from Georgia to Maine, including nearly 200 miles in North Carolina. Bluets (left) and toadstools (above) dot the landscape in early spring.*

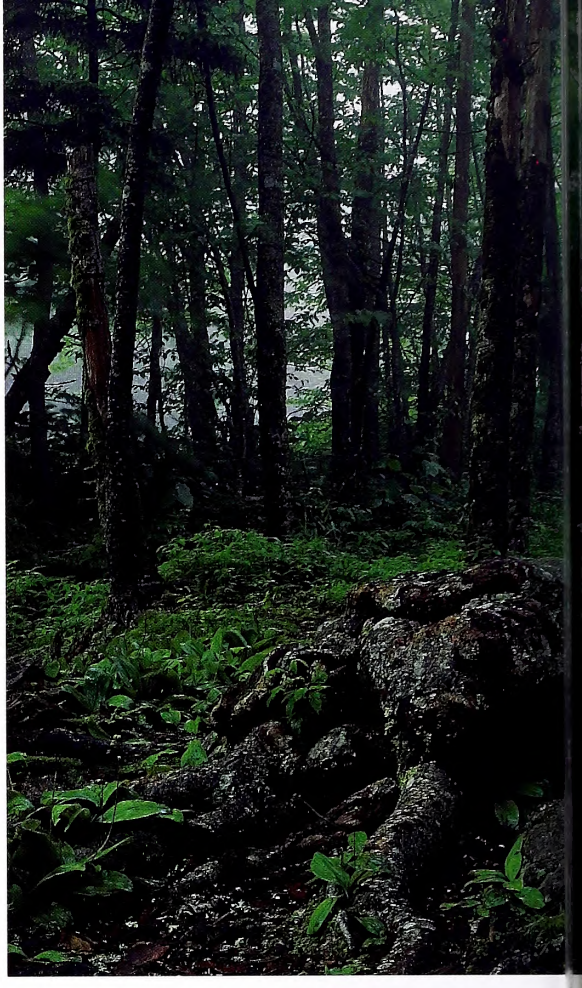
For many through-hikers including Robert Sharp (middle photo) the solitude of weeks on the Appalachian Trail is softened by the beauty of nature and the many plant and wildlife species encountered along the way. Appalachian cottontails (top) can be seen at higher elevations while native azaleas grow at lower elevations.

lack of movement puzzles me until I realize that it basically backed up to the edge of the steep cliff with nowhere to go without a parachute. Jody shoots a few photos of the hapless creature and then we move, giving the rabbit some peace.

The trail then heads back downhill on a series of switchbacks through a wind-ripped white oak forest. We arrive at Beech Gap (elev. 4,490 feet) and continue on toward Carter Gap. But when we arrive at Carter—with eight miles under our belts—a boisterous band of weekend Boy Scouts spilling out of the camping shelter convinces us to push on a little farther before we settle down for the evening.

We climb up the north side of Ridgepole Mountain, then down into a deep gap as we begin to head true north for the first time. We plod through a relatively flat stretch of alternating open woods and rhododendron tunnels, and I contemplate the effort it took to construct the Appalachian Trail. The AT is much more than just a path through the woods. Founded in the 1930s in the vision of one man—Benton MacKaye—and maintained by a group of hiking clubs, it is a national scenic trail, part of the same national park system that includes Yellowstone, Yosemite and the Great Smoky Mountains. Its official name is the Appalachian National Scenic Trail. But, unlike those parks, it's not a concentrated preserve with campgrounds and paths within its boundaries. As the longest, skinniest part of America's national park system, the AT stretches over 14 different states and passes through more than 60 federal, state and local parks and forests. Hundreds of roads cross it. In some parts, the protected corridor of the trail is only a few hundred feet wide. The purpose of hiking the trail, according to MacKaye, is "to see, and to see what you see." All I see is a green, tangled mass of rhododendron, laurel and a red cooking pot rhythmically bouncing off Jody's black nylon pack. Still, I'm starting to get the idea of what old Benton was thinking—slow down and let it all sink in.

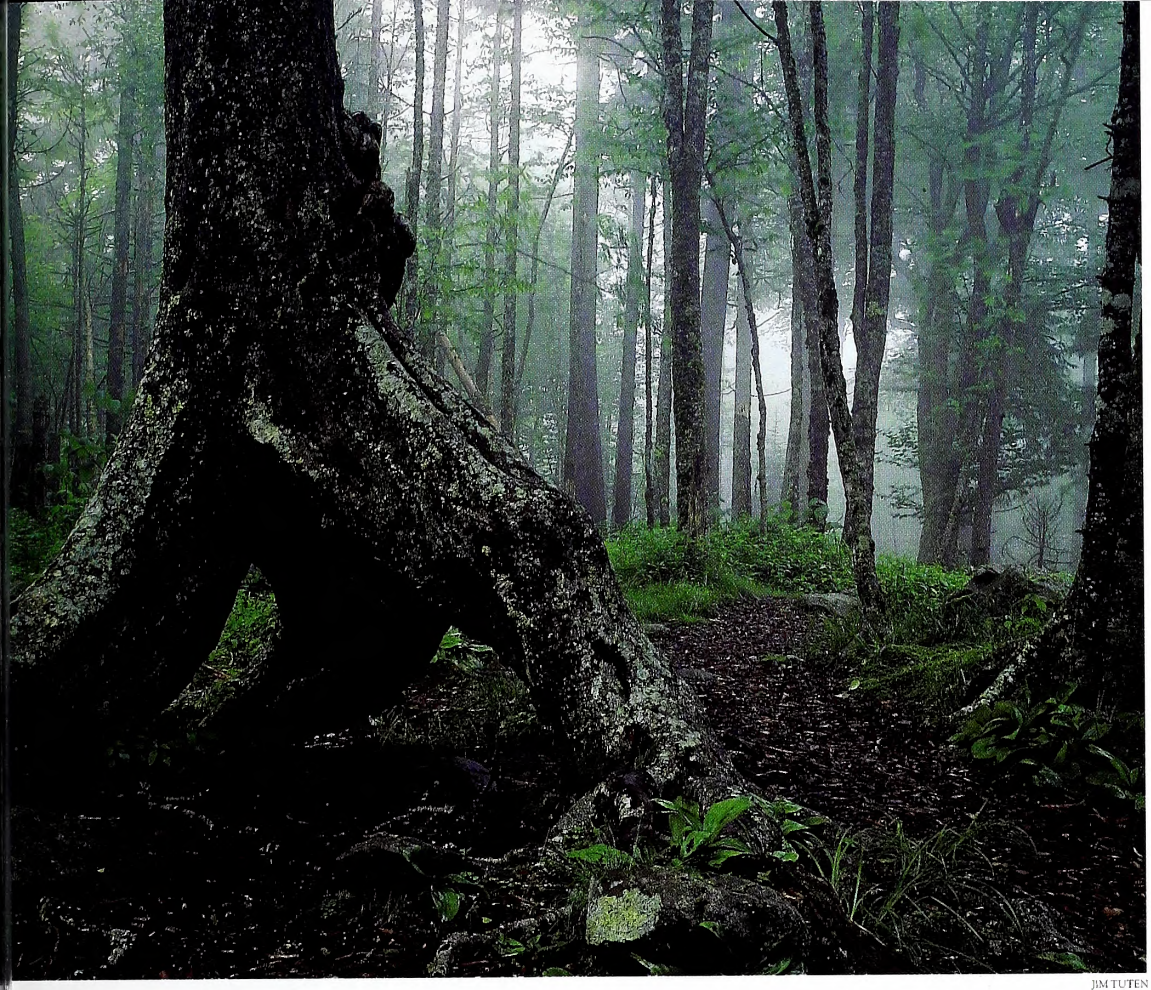
My feet are beginning to throb and burn as I walk over tangled roots and loose rocks. Two hours and one seemingly continuous rhododendron hell later, we finally emerge from the tunnel of evergreen in the half light and find a flat, clear spot to set up our tents. A wooden sign marks this as Betty Gap (elev. 4,320 feet). With 12.2 miles under our belts, we are beat. I can hear a small stream nearby, but I am too tired to make a water run. Having felt the blisters building under my boots for nearly an hour, I slowly remove the leather to reveal my mangled feet. Two large blisters on my left heel need bursting, but I don't have the strength. There is little conversation between Jody and me as we prepare camp, taking care to string up our food high in a sycamore to keep the bears out. I eat a hot bowl of Ramen noodles, and he has some soup, then we slither into our tents for the evening.



Day 2 The scream of a bobcat startles me awake, but it takes a half-hour before I finally gather the strength to unzip my tent and crawl out in the misty morning. Every muscle in my body is stiff, sore and aching. Jody's moans echo my thoughts. Yesterday's jaunt has really taken its toll on our soft bodies. We down a handful of ibuprofen with breakfast—instant oatmeal and grits—before preparing to break camp. Our feet will need some attention if we're to make a second day, yet alone a week on this trail. Jody's feet are actually worse off than mine. He has blisters the size of grapes on his small toes. We burst and drain the blisters with a sterilized needle and wrap our feet tight in gauze and moleskin for cushion.

The nearly vertical ascent of Mount Albert—infamous for punishing out-of-shape hikers—lies ahead of us. We lace up our boots and cram our gear into our packs. Why did we bring so much stuff, anyway? Did we really need rain gear? The only consolation to the weight is that much of it is in food, meaning we will actually eat our packs lighter. I go ahead and gulp down a handful of homemade trail mix, reducing my pack weight by 2 ounces. Every ounce counts on the trail. A band of dark-eyed juncos flits around our camp, absolutely oblivious to our presence.

We twist our way through a beautiful, mature, hardwood cove forest. The walking is good; it stretches our muscles and clears our heads. Yellow, alien-looking



JIM TUTEN

flowers of squawroot (*Conopholis americana*) emerge all along the trail on a dry oak ridge. The shoots of ramps (*Allium tricoccum*) and developing Jack-in-the-pulpits (*Arisaema triphyllum*) are scattered along the trail in moist coves.

A lone deer spooks and bolts down a mountain ridge and into a laurel thicket as we pass by. Just as I begin to take the gorgeous scenery for granted, a gray sign marks the end of the Southern Nantahala Wilderness Area. The forest immediately changes. Now we are in a thick, young forest—freshly clear-cut maybe 20 to 30 years back. Armies of mayapples (*Podophyllum peltatum*) stand in the openings below us on an old logging road. Floating along this road, I can almost hear the saws cutting their way up the mountain.

We try our hands at cliff hanging as the AT skirts around the eastern side of Big Butt Mountain. Downed trees, a muddy trail and few handholds make this section interesting as the narrow trail hugs the edge of the cliff.

The base of Mount Albert (elev. 5,220 feet) comes quickly once we get off the cliff. A chocolate-and-peanut butter energy bar seems in order before the ascension of the mount. This is the steepest rock scramble the southern AT has to offer. The trail goes straight up, more like a set of rock-hewn stairs than a natural mountain. We slowly progress—step by step—upward like overloaded mountain goats. Three-tenths of a mile later, we reach the summit drenched in sweat on this balmy spring day. Steve Spanogle, a mechanical engineer from Huntsville, Ala., greets us from his perch on a large, flat rock. "So what did you think of Mount Albert?" he asks, before taking a swig from a nonalcoholic beer. Instead of backpacking attire, the fit, middle-aged man is wearing jogging shorts and a tank top. Jody and I both look at each other incredulously and silently ask the same question: (*Does he have on running shoes?*)

Spanogle answers the question out loud: "Yep, I'm running the Appalachian Trail. I did 16 miles yesterday. Plan on doing 24 miles today. I can do 75 miles in a long weekend." He wears a waist pack and a small backpack—about 11 pounds of mostly water and food—and a can of pepper spray for the possibility of a rogue bear.

I had nearly twisted my ankle five times in the first day WALKING the AT, so how could someone run this twisted goat path? "I used to run triathlons then took up trail running about 10 years ago," the 42-year-old explains. He plans to run all the way to Maine in three-day jaunts. "There is a fellow up in Virginia who set the record running the AT in roughly 50 days," Spanogle goes on. "I have no desire to do it that fast. I just simply want to do it. With my job, I don't have the time to do the trail on a through-hike with a pack walking; I would never get there in my lifetime. So the idea is basically do 300 miles each year and I can do it in 7 years." It took this weekend warrior three hours

Field Notes

One Long Haul

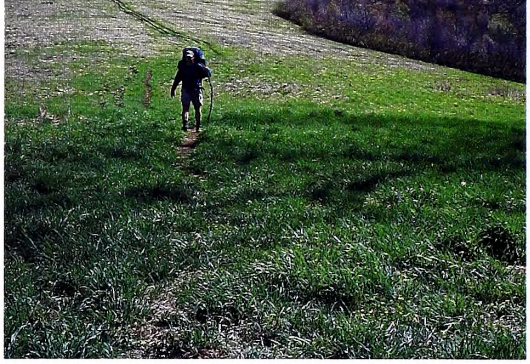
Completing the entire 2,160 miles of the Appalachian Trail in one trip is a major undertaking. Each year, several thousand hikers attempt a thru-hike; only about three in 20 make it all the way. (As of February 2003, 7,183 hike completions of the entire AT had been reported to the Appalachian Trail Conference, a nonprofit group that oversees the trail in all 14 states.) The trip typically takes about six months.

Northbounders hike from Georgia to Maine in one continuous journey, and represent the largest portion of reported 2,000-milers—more than 60 percent. Most leave Springer Mountain, Ga., in March or April.

Southbounders hike from Maine to Georgia in one continuous journey, and represent about 5 percent of total reported 2,000-milers.

Flip-floppers complete the trail in one trip, but with an alternate itinerary such as hiking from Georgia to West Virginia, then Maine back to West Virginia. Flip-floppers make up about 10 percent of reported 2,000-milers.

Section hikers complete the Appalachian Trail in more than one trip. They currently comprise about 20 percent of total 2,000-milers.



The Appalachian Trail encounters many different habitats as it rises and falls across North Carolina. Grassy and open, Siler Bald (elevation 4,940) provides a panoramic view of Macon County. Moist woods along lower points of the trail shelter a variety of flowering trilliums.

GEORGE HUMPHRIES

to drive here from Alabama, and the distance will only get longer for each successive section of the trail.

A larger question looms, and again Spanogle proves the mind reader. "Why the AT?" he asks rhetorically. "Because it is here, and it is something that I can do over a long period of time. There are very few opportunities in the whole world to stay on a continuous trail over 2,000 miles."

"So what do you do when the day's done?" I ask him, trying to figure out the logistics of his trip.

"I've got a cell phone," he responds, bursting into laughter. "I call my wife to come pick me up! She's antique shopping down in the valley, and I'm running the AT. We're both happy."

We wish him luck and make the final few yards to crest Mount Albert. At the summit, a 50-foot steel fire tower stands watch. In the swirling, warm winds, the view is spectacular in all directions. We can make out nearby Fishhawk and Whiteside mountains and even the Smokies far to the northwest. We linger and take in the top-of-the-world view as another hiker crests the summit and stands panting against one of the legs of the tower.

"Where you from?" I ask the man, guessing by his hiking poles that he may be a through-hiker.

"Louisiana," he responds.

"Where you heading?" I continue.

"Just heading north," is his simple answer.

Robert Sharp, 53, is a practicing attorney, husband and father of two back in Ruston, La. But here on the AT, he goes by "Little Bob"—his trail handle since he started at Springer Mountain in Georgia on April 11. His bluish-gray eyes show determination, and at 5 feet, 6 inches, his trail name seems appropriate.

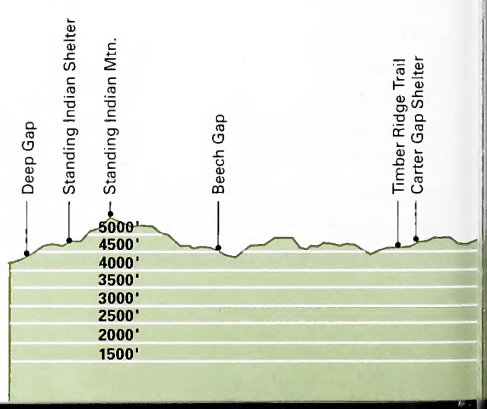
Little Bob, like most through-hikers, is attempting the northbound trek to Maine alone. Not only will he be fighting fatigue and loneliness over a 2,000-mile stretch, but also the weather if he makes it far enough. The terminus of the trail in Maine is closed on Oct. 15 due to harsh winter weather. So that means he has to keep up an average pace of 12 miles per day, with few town stops for rest and resupply to complete the six-month journey. It's a daunting task, and the odds are against him: Only 10 percent of those who intend to hike the entire AT actually make it to Maine. In fact, half of all through-hikers call it quits in the first 60 miles—before they ever get out of Georgia. Of those that make it out of Georgia, 50 percent quit before Damascus, Va.—just across the border from Tennessee.

HARDLY A WALK IN THE PARK

The Appalachian Trail enters North Carolina from Georgia at Bly Gap, but the nearest road access to the trail is Deep Gap on the Clay-Macon County line. The trail actually heads south from Deep Gap through the Nantahala National Forest for several miles before bending back to the north near Carter Gap for a 52-mile up-and-down trek (right) to Wesser on the Nantahala River.

From Wesser the AT climbs to Fontana Dam (not shown) then makes it way through the Great Smoky Mountains National Park, then hugs the North Carolina-Tennessee border on its way to Virginia.

Source: Appalachian Trail Conference



So Sharp has made the first cut. "I hear once you cross into North Carolina it doesn't get easy—it never gets easy—but it's not quite so much up and down, which has been true except for Albert Mountain, which was a bitch! But well worth the view," he says, spreading his arms out wide.

Loneliness and hours of endless walking take their toll. "It is a strange kind of loneliness out here on the trail," Sharp explains. "Everyone is very friendly and you run into them, then they are gone. There were the three girls from Philadelphia—one was carrying a 70-pound pack and a skillet on her back. They were going all the way to Maine, and they were making just four miles a day from shelter to shelter. They were caught in a thunderstorm and never made it out of Georgia. Everyone has their own pace, so it's hard to stay together with other hikers. I have good days and bad days," he goes on. "I was trying to make 15 miles a day in Georgia, and I couldn't do it. I told myself if I had a telephone right here, I'd call my wife and get her to come get me. Then you get a full night's rest, and you're ready to get started again."

We wish Little Bob luck and get back on the trail. Our goal is to make it to Rock Gap Shelter by sunset, and it's already 2:30.

Trail magic means good fortune on the AT. Our first taste occurs 20 miles into our trek at Rock Gap Shelter. "Believe in yourself. No one ever said it would be easy," reads the simple, hand-written card in the jar of Chips Ahoys. In the icy spring a few feet away are a half-dozen Pepsis. We each grab a cold drink and munch on a cookie. It's amazing the things you take for granted.

Three hikers come 'round the bend and join us in the feast provided by the anonymous benefactor, a.k.a. a trail angel on the AT. "These are the best biscuits I've ever had," exclaims one of the trio, as he stuffs a whole cookie in his mouth. I quickly realize they're not from these parts.

Richard, Steve and Adam, ages 30, 29 and 28, respectively, are from Nottingham, England, a town famous for its blue cheese. Collectively, they are known as "The English Guys" on the trail. Friends since childhood, they decided to quit their jobs and give the Appalachian Trail a try on 6-month tourist visas. None had ever been to America.

"It's amazing, really, that people went to that sort of trouble to put out these biscuits," Adam interjects. "We will thank them in the logbook." The logbook is a spiral-bound notebook in which hikers put their thoughts for the day, poetry, drawings, notes to each other and other rantings. Each of the shelters has one of the books and a pencil or pen.

"Where are all the hillbillies?" Steve asks us. "We were wondering where they all were." We realize that even overseas the South is stereotyped—brown jugs and all. Though we have rightful claim to the shelter, Jody and I elect to give it up to the Englishmen to show our Southern hospitality. (The shelters are also home to rats and mice because of all the food bits left by hikers.)

We have just finished setting up our tents under the stars when a familiar face arrives—Little Bob. He bunks down near us as the last rays of light disappear in the west. We sit up and talk about the trail—plants, animals and life—over our instant meals. Jody admits he's already had enough of trail life, but I've been bitten. Maybe it's the sense of freedom and adventure. Or the simplicity of living out of a pack.

"Rodney, sounds like you might like to go all the way," Little Bob says. "Why don't you join me?" The offer is tempting. No time like the present.

"I'll think about it, Bob."

Day 3

A spatter of rain quickly turns into a deluge around 4 a.m., waking everyone early in camp. The rain slackens a little after dawn, and we pack up. The Englishmen are up and out. They are heading down the ridge to Wallace Gap to hitch a ride at the highway to Franklin for food and supplies. There's a spring in their steps that only a motel bed and hot shower can explain.

Bob fills his canteens directly from a small pipe in the spring and takes a long swallow. "Won't kill you," he says. "I just put iodine in it if the water is too cloudy."

When in Rome. . . . Jody and I simultaneously decide to abandon our water filter. We take deep gulps of the cold mountain water from the PVC pipe. We're dirty, we're sore, and we're starting to fit in.

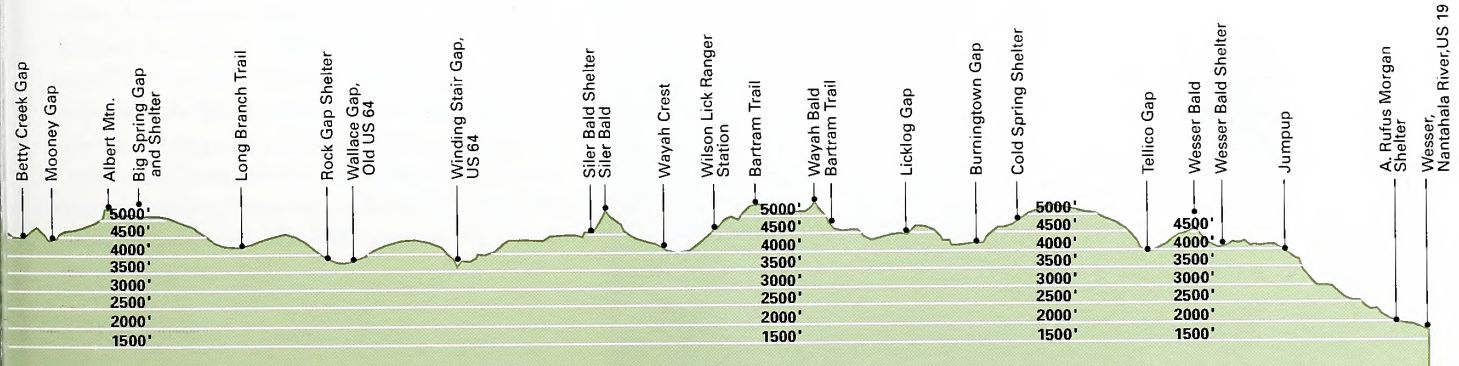
Bob leans over like a riverboat gambler giving up his best card trick. "Boys, I'll tell the truth: Things don't matter in life," he says. "I've had them all—boats, cars, homes. What matters are your relationships with people and Nature. People can be mean and selfish, but being on this trail has got to make you better. I don't see how it could make you more self-centered and selfish."

Ten minutes later, Bob's packed up and his hiking poles are steadily moving as he makes his way north and away from Rock Gap Shelter. Jody and I linger

Field Notes

Hiking Milestones

- First 2,000 miler. In 1936, Myron Avery walked and measured every step of the flagged or constructed route.
- First reported thru-hiker. In 1948, Earl V. Shaffer walked the entire trail from Georgia to Maine. He hiked again in 1965—this time from Maine to Georgia. On his third thru-hike, in 1998, 50 years after his first hike, he became the oldest thru-hiker at age 79.
- Oldest section hiker. The oldest section-hiker walked from 1972 to 1975, completing the trail after he turned 86.
- Youngest thru-hiker. A 6-year-old boy completed a flip-flop thru-hike with his parents in 1980. Twenty-two years later in 2002 another 6-year-old boy completed a flip-flop thru-hike with his parents and 8-year-old sister.
- Youngest female thru-hiker. The youngest female to thru-hike was 8 when she completed hiking the trail in 2002 as part of a family group.
- Oldest female thru-hiker. Emma Gatewood, mother of 11 children and grandmother of 23, was 67 when she first hiked the trail in 1955. She completed her second thru-hike in 1957, and became the first person to complete the trail three times when she finished a section hike in 1964.



Brilliant flame *azaleas (right) and crested dwarf irises (below) punctuate the Appalachian Trail with color in the spring. A red eft also provides a spot of color as the author makes notes at the Cold Spring Shelter.*

GEORGE HUMPHRIES

GEORGE HUMPHRIES

to read some of the journal entries in the shelter and then pack it up ourselves.

Hump, hump and hump. Jody and I start to dread the word "gap." It means only one thing: a straight-down descent, then a straight-up ascent back to the same height you started at. What a waste of energy. First Wallace Gap, then Winding Stair Gap. (Hernando de Soto supposedly passed through here in 1540 on his way to the Mississippi.)

The weather is much cooler today, and the sky begins to clear. I think of Bob's words as the miles blur together. We glide through sheltered cove forests with tulip trees overhead, then hemlocks. We zigzag up and down ridges. We walk the crest of the mountains in the clouds. And we make our way to Siler Bald (elev. 4,940 feet)—an open, grassy place with a panoramic view of the world—in the afternoon.

The wind is blowing hard and cold from the northwest. Spring has retreated from these mountains as we head down to Wayah Gap. We push onward to the base of Wine Spring Bald and set up camp in an opening. The sky takes on a purplish hue, and the wind howls all night as we hunker down in this grassy field.

Day 4 With two days to go, we lighten our loads this cold morning before the trek up to Wine Spring Bald. Jody dumps several pounds of trail mix from his pack and I burn off some additional fuel for the pack stove. The wind has slackened, and high pressure has set in as we begin the steep climb to the top. Botanist William Bartram visited this same bald in 1775. The Bartram Trail, named in his honor and marked with blue, plastic blazes, joins the AT for the next 1.5 miles as we follow the crest of a ridge northeast toward Wayah Bald (elev. 5,340 feet).

We arrive at Wayah Bald around 2 p.m. and climb a stone observation tower built in the 1930s by the Civilian Conservation Corps (CCC). The view is breathtaking on this crisp, clear day. Below to the east is Franklin wrapped in a green valley, and Mount Albert and its fire tower are farther away to the south.

We eat our lunch of trail mix and beef jerky on a stone wall in the sun overlooking Franklin, convinced the worst is behind us. Victor Forbes, a retired engineer from the valley, sets us straight. "You just finished the easy part," he says with a grin. "You're OK from here to Tellico Gap. From there, you will climb Wesser Bald where there's another tower. But from there on, you're in a downhill run all the way. Get your legs in shape for that last day. In 6½ miles, you're going down about 3,000 feet. All down. It's mighty tough on the knees."

Great. We thought downhill would be easy. Victor knows the trail, all right; turns out he maintains this section of the AT as a volunteer with the Nantahala Hiking Club. Once a week, he goes out with a small crew to paint white blazes on the trail, trim limbs and briers and report any major problems. A heavy crew—also volunteers—comes in to clear downed trees, reroute the trail if necessary and build and maintain the shelters. Collectively, they are responsible for the section we've been hiking from the Georgia line to Wesser.

It's a labor of love for Victor, in his fifth year as a trail volunteer. "Why do I do this?" he asks. "That is an easy one. This is the only thing I've found that gives me something I want to do outside and a feeling like I'm doing something productive at the same time. I've never felt so appreciated. I meet people on the trail and they want to shake my hand and thank me. It gives you a good feeling. Many hikers tell me that this is one of the best-maintained stretches of the trail."

The Bartram Trail splits to the right away from the AT at the bottom of Wayah Bald. We continue left to Licklog Gap then Burningtown Gap, where we take a breather and watch a Cooper's hawk land gracefully in an overgrown apple tree.

For a good part of the next hour, Jody gets ahead of me on the trail. And for the first time, I feel alone out here in the wilderness. It is a disheartening feeling. Around each bend, I expect to see him waiting on me, but he is not there. I finally come up on Jody at Cold Spring Shelter, sitting there on the wooden porch, smiling. "What took you so long?" he jabs. "Can't keep up?" I've led most of the way, but this gives him a sense of satisfaction.

We decide to push on for another hour and come across a perfect little sheltered cove with a fire ring, a spring and large logs to sit on. Someone has even left a fresh pile of firewood for us. I roll a few of the logs over to see what critters are underneath and find several salamanders, their smooth skin glistening in the half light of evening. Under the weather, Jody gets in his tent and skips dinner. I go ahead and prepare my last meal of Ramen noodles. I sit on the old log and watch the smoke from the fire rise up out of the little cove and into the night sky. The stars twinkle overhead, and I can't help but wonder how many other visitors over the years have sat in this secluded spot and watched the world turn.

Day 5 Jody is feeling better, and he downs a full helping of instant grits while I eat yet another pack of dried oatmeal. Grubby, smoke-covered, our spirits are high. This is our last day on the trail. Our Maine is down in the valley at Wesser. Much of the morning's discussion revolves around food. We've had nothing but trail grub for nearly a week. What are we going to eat when we get to town in Bryson City? The debate goes back and forth between hamburgers and pizza as we limp our way up Wesser Bald (elev. 4,630 feet), and I turn my ankle for the 10th time. The trail wavers up and down for a mile or two over rocky terrain. We walk on the spine of a narrow, rocky ridge with the mountain falling off on both sides. Table Mountain pines cling to the rocks, their slippery needles making the footing treacherous. We've reached the Jumpup (if you're going South), and rocky steps lead us nearly straight down as we drop a thousand feet in a mile. My knees are pounded with each step.

At 3,800 feet, I find a dainty pink lady's slipper (*Cypripedium acaule*) growing beside a rock on the trail itself. The foliage is greening up as we drop. Spring has arrived to these lower elevations with Solomon's seal in bloom. Switchback upon switchback—we are coming down. Fresh, green leaves start to appear, and our view of the valley is obstructed. Clusters of purple and white crested dwarf irises (*Iris cristata*) blanket the edges of the trail. I take in every step. Then it all ends. We walk across a wooden bridge over a little creek and we step out into an opening onto a busy highway at the Nantahala Outdoor Center. Weathered and grizzled, we attract no notice. The world has suddenly sped up, and we dodge traffic to cross the highway. A rain shower blankets the truck as we drive to the pizza place. ⊠

Field Notes

Getting Started

Whether you want to make a weekend hike on the Appalachian Trail or launch a thru-hike, you'll need to prepare before setting off. Food, equipment, maps, transportation, physical and mental preparedness all need to be considered before striking out on the trail. For some sections of the trail, such as the portion through the Great Smoky Mountains National Park, special permits are also required.

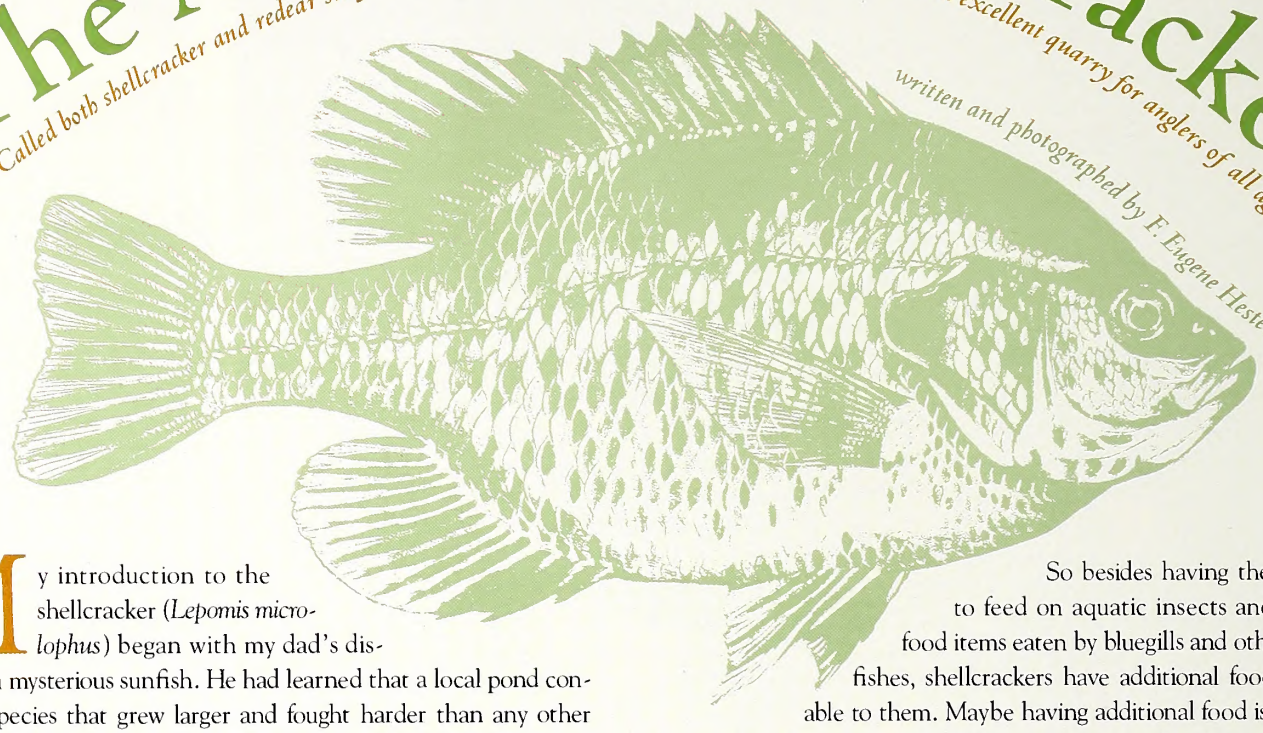
One of the best sources of information on aspects of the trail is the Appalachian Trail Conference. The nonprofit, volunteer-based organization has been building, protecting and managing the trail since 1925. The ATC also has an outstanding website that covers everything from the trail's history, current trail conditions, state-by-state details of trail sections, choosing gear and food, maps, physical preparation and suggested reading materials.

For more information, contact: Appalachian Trail Conference, 799 Washington St., P.O. Box 807, Harpers Ferry, W. Va., 25425-0807, Phone: (304) 535-6331, Web site: www.appalachiantrail.org

The Amazing Shellcracker

Called both shellcracker and redear sunfish, this feisty species is as interesting as it is an excellent quarry for anglers of all ages.

Written and photographed by F. Eugene Hester



My introduction to the shellcracker (*Lepomis microlophus*) began with my dad's discovery of a mysterious sunfish. He had learned that a local pond contained a species that grew larger and fought harder than any other sunfish he had been catching. He knew them as "strawberry bream," and he was eager to fish for them.

That was decades ago, and the shellcracker was indeed a rare species in most of North Carolina at that time. The species' historic range was mainly in the Mississippi basin and in coastal areas from Texas to South Carolina. A few populations were also found in the southeastern corner of North Carolina.

My dad was not the only person to recognize that this fast-growing sunfish had many desirable characteristics. Experimentation by several state and federal agencies found that though this fish was not a substitute for bluegills in stocking new ponds and reservoirs, it was a good addition. From then on, the standard stocking program for new ponds became a bass-bluegill-shellcracker combination. The shellcrackers become something of a bonus by growing larger and consuming snails that usually are not eaten by other fish.

Over the years a lot of people have come to know and appreciate the shellcracker. The species gets its nickname from its habit of feeding on snails and small clams that it cracks open with special teeth in its throat. The teeth are not the needle-sharp type found in the mouths of chain pickerel but are broad, pavementlike pharyngeal (throat) teeth with flat surfaces, which are well suited for crushing shells.

JIM DEAN

***Though it might be** confused with the bluegill (above, right), the shellcracker (above, left) can grow much faster.*

So besides having the ability to feed on aquatic insects and other food items eaten by bluegills and other sunfishes, shellcrackers have additional food available to them. Maybe having additional food is one of the factors that helps shellcrackers grow so fast. In most ponds where bluegills and shellcrackers exist, the shellcrackers will be about 50 percent larger than the bluegills.

Shellcrackers also produce fewer young than bluegills and therefore help limit competition for food. Shellcrackers are wary, too. Instead of being aggressive when nesting, they quickly retreat to deeper water when disturbed. This makes them less vulnerable to predators.

In my early experiences with shellcrackers, I learned of this wariness. In shallow water near a pond border, I could see about two dozen sunfish nests. They were large nests, with the rims almost touching each other. I could see adult fish in the nests. But when I approached, the adults quickly disappeared by swimming into deeper water.

When I later tried sneaking up on the area and gently casting a small floating popping bug over the nests, I learned something else about these fish. They did not attack this floating lure as a bluegill would have. Instead, they ignored it. From that experience I learned of their wariness and reluctance to take surface lures.

In the spring, prior to spawning time, shellcrackers often gather in groups under a large log or other cover in shallow water. This is similar to the way dozens of crappies school up under a bush or a brush pile.

Redear sunfish can *be taken on a variety of lures and baits from beetlespins (above) to worms and a cork (opposite page).*

When they are not nesting, shellcrackers are often found in deeper water close to stumps, trees or logs. Though they are reluctant to take a popping bug on the surface, they are less hesitant to go after a sinking wet fly. Some fishermen have found that a wet fly on an 18-inch line tied to a popping bug makes a great combination. The popping bug continues to attract bluegills, and the sinking wet fly trails below and behind the floating bug in the strike zone for shellcrackers. The popping bug serves to attract fish to its surface activities and entices them to the sinking fly. The popping bug also serves as a strike indicator, since it disappears when a fish takes the wet fly.

There are a lot of ways to catch shellcrackers. In addition to a fly rod with popping bug and dropper fly, ultralight spinning tackle will work to catch them. Small lead-head jigs with plastic curlytails, beetlespins and roostertail spinners are all great lures.

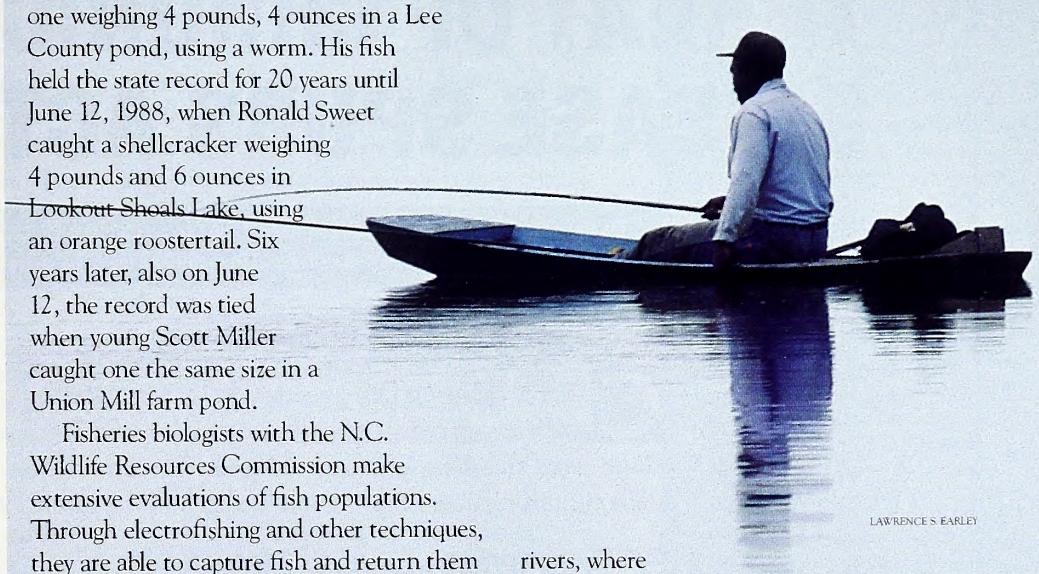
Probably the most often used and most effective technique is a simple cane or fiberglass pole rigged with monofilament line and a cork, sinker and hook. Earthworms are great bait, and generally the larger they are, the more effective they are. Red wigglers, garden earthworms and night crawlers are readily taken by shellcrackers. Placing the worms as close as possible to trees or stumps in water about 3 feet deep is a great approach.

Shellcrackers are most often found in warm, quiet, clear water with plenty of stumps, logs, aquatic vegetation or other cover. But they sometimes inhabit brackish water, too. And in North Carolina, they sometimes exist in tidal creeks alongside small flounders, pinfish and stumps with barnacles.

The shellcracker is a deep, slab-sided sunfish with a small mouth. It is similar in appearance to its close relatives, the bluegill and pumpkinseed. Its back and sides are usually yellow, golden or a light olive green. Sometimes dark vertical bars are visible, but they are seldom present on adults.

Shellcrackers have long, pointed pectoral fins and a rounded earflap with a thin, flexible margin. The earflap has a whitish border and a prominent red or orange spot in adults, from which the fish gets the name "redear sunfish." Shellcrackers do not have the blue wavy lines across the cheeks so prominent in pumpkinseeds. When in spawning condition, male shellcrackers have a dark, smoky appearance.

Shellcrackers have the capacity to grow very fast and very large. It is not uncommon to catch one weighing a pound or more. At various times and places, they grow much bigger. Over the years, monster shellcrackers have been entered in the North Carolina records. On Feb. 3, 1968, Bill Arnold caught one weighing 4 pounds, 4 ounces in a Lee County pond, using a worm. His fish held the state record for 20 years until June 12, 1988, when Ronald Sweet caught a shellcracker weighing 4 pounds and 6 ounces in Lookout Shoals Lake, using an orange roostertail. Six years later, also on June 12, the record was tied when young Scott Miller caught one the same size in a Union Mill farm pond.



LAWRENCE S. EARLEY

Fisheries biologists with the N.C. Wildlife Resources Commission make extensive evaluations of fish populations. Through electrofishing and other techniques, they are able to capture fish and return them alive to the water.

I asked a couple of biologists about good places to find good numbers and sizes of shellcrackers.

Fisheries biologist Chad Thomas identified the Chowan and Roanoke rivers as having exceptional redear populations. "Redear are second to bluegill as the most abundant sunfish in the Roanoke, comprising 29 percent of our total catch," Thomas said. "Redear between 8 and 10 inches were the most abundant size group in our spring collections." He found the population to be relatively stable over the past several years.

Thomas also found a high number of 8- to 10-inch redear sunfish in the Chowan River. "Interestingly," he said, "we have seen a tremendous increase in the number of redear sunfish in the Chowan River over the last 10 years. Currently, redear sunfish represent 27 percent of our sunfish samples in the Chowan River, compared to 1 percent just 10 years ago.

One thing that jumps out every year, Thomas added, is the number of large redears in the sample. So many big fish suggests that either few anglers know about this fishery or, more likely, that redear sunfish are more difficult to catch than the other sunfish.

Redear sunfish spend large amounts of time in deeper water or in heavy cover. The best time to catch them is when they move onto the spawning beds, usually at water temperatures between 66 and 70 degrees, Thomas said. "We usually find them on softer substrates along the edges of lily pads." He explained that redear are scarce in the Pasquotank, Perquimans and Scuppernong rivers, where pumpkinseeds are second to bluegill as the most abundant sunfish.

"How about big redear sunfish?" I asked.

Thomas told me about shocking them up to 1.5 pounds in the Chowan River and a 2.5-pound giant in the Roanoke River. I asked him where I would likely have the best chance of catching shellcrackers.

"On the Roanoke, we see the greatest number of redear sunfish downstream of Jamesville, where the river widens and the mud flats appear," he said. "Redear densities are high all the way down to the sound. Creek mouths seem to be pretty hot, especially the mouth of Broad Creek, Middle River and Conaby Creek. On the Chowan, we have good catches in creeks including Sarem, Barnes, Catherines, Bennetts and the Wiccacon."

Biologist Keith Ashley told me of other great places to find redear sunfish. He identified the Black River in Bladen County, especially near N.C. 210 near Rowan, just above and below the N.C. 53 bridge, and the area upstream from Ivanhoe. He has found redear sunfish as large as 1.5 to 2.25 pounds in this river. He advised fishing among spatterdock growing along the downstream ends of islands.

Virginia, Florida and other southeastern states also have state-record shellcrackers weighing between 4 and 5 pounds. And the world-record redear sunfish—a whopping 5 pounds, 7 ounces—was caught in the Diversion Canal near Charleston, S.C., in 1998.

If snails and clams are such favorite foods for shellcrackers, does anybody use these for bait? I haven't met anyone yet, but maybe these will be the hot new baits of the future. ⊠

THREAT OF CHRONIC WASTING DISEASE SPURS ACTION

written by Kate Pipkin

Proposed rules to prohibit the transportation of captive deer and elk are the surest means to stop the arrival of Chronic Wasting Disease.

Chronic Wasting Disease, or CWD, has been covered in the national press and in virtually every outdoor magazine in the last few months. But there are still many questions about what this disease means to North Carolina hunters, hunting traditions, the state's $600 million hunting economy, human health and the future of our deer herd.

CWD—Snapshot

CWD is a neurological disease of deer, elk and related animals (collectively called cervids) characterized by microscopic empty spaces in the brain matter. It was first recognized as a clinical "wasting" syndrome in 1967 in mule deer at a wildlife research facility in northern Colorado. Afflicted animals exhibit unusual behavior and eventually die. The source of the disease appears to be an abnormal protein, called a prion, in the nervous system. Although the exact method of infection is unknown, biologists know that direct animal-to-animal contact is a means of transmission. However, evidence also suggests that direct animal-to-animal contact is not always necessary, and that contaminated environments present a risk. Animals may not show symptoms for five years, but once they do, death is certain. There is no treatment or cure. No live-animal test for CWD exists.

As of this publication date, there are no known cases of CWD in North Carolina or in adjoining states. There has been no documented case of a human contracting a CWD-like disease from deer. For optimal safety, however, the Commission recommends people do not consume any of the following organs: brain, eyeballs, spinal cord, spleen and lymph nodes, or eat meat from a deer that looks sick.

Since the ultimate effects of this disease may be locally devastating for a deer herd, the Commission is determined to keep the disease out of our borders, or, if it has been imported via a captive cervid (see below), completely contained. Therefore, the Commission has temporarily amended rules to protect the wild deer herd. If not overruled by the legislature, these rules will become permanent.

The most likely route of introduction—were CWD to come to our state—would be by importation of a captive cervid. Indeed, other states and provinces in Canada seem to have contracted CWD from the movement of infected captive cervids.

Why do North Carolinians hold cervids in captivity? A few are farmers, raising fallow deer and elk for their meat or parts under a North Carolina Department of Agriculture (NCDA) program. Others run petting zoos, breed cervids for sale, or have an interest in

EVIN STANFORD

SIGNS OF CHRONIC WASTING DISEASE

- isolation from other animals
- listlessness
- lack of coordination
- frequent lowering of the head
- blank facial expressions
- repetitive walking in set patterns
- drooling and grinding of teeth
- drinking lots of water & increased urination
- extreme low weight

F. EUGENE HESTER

The transportation of captive cervids, such as white-tailed deer (right), has been the main cause behind the rapid spread of Chronic Wasting Disease in the United States.

wildlife. North Carolina does not allow the hunting of captive cervids. We have relatively few licensed captive facilities (82) compared to states that do allow this type of hunting (950 captive facilities in Wisconsin, for example). For more than two decades, the commission has required any citizen wishing to hold cervids in captivity to obtain a license and follow rules. These include maintaining a properly sized facility; isolating captive cervids from other captive animals; providing a water source and shelter area and reporting all deaths to the state Department of Agriculture.

In order to prevent an infected animal from coming into North Carolina and to isolate captive cervids that are potential carriers of CWD, the Commission's new rules focus on the holding, identification and movement of captive cervids.

WILLIAMS LEA

Wild White-tailed Deer and Elk

Under the new rules, private individuals are no longer allowed to hold injured or orphaned wild deer for rehabilitation. Such animals must be reported to a Commission representative immediately.

Cases of truly orphaned or abandoned fawns are extremely rare. Usually a doe is nearby watching her fawn. As always, the Commission urges the public to leave fawns alone. Picking up a fawn or repeatedly visiting it will make the doe nervous and may prevent her from caring for her fawn. Respect nature and do not treat a fawn like a domestic animal in need of human care.

None of the rules and procedures to protect North Carolina's wild deer herd from CWD will interfere with normal hunting activities. Nor are there new rules for hunting in North Carolina that pertain to CWD. If you decide to hunt deer, elk or related wildlife **outside** of North Carolina, the Commission recommends that you bring back only:

- meat that is cut and wrapped (either commercially or privately)
- quarters or other portions of meat with no part of the spinal column or head attached
- meat that has been boned out
- hides with no heads attached
- clean hides (no meat or tissue attached)
- skull plates with antlers attached
- antlers with no meat or tissue attached
- upper canine teeth (i.e., "buglers," "whistlers" or "ivories")
- finished taxidermy heads

If you hunt in a state with an active CWD outbreak, please consult that state's wildlife agency for special restrictions or recommendations.

The Future of North Carolina's Wild Deer Herd

Wildlife biologists are currently taking samples from wild deer to test for CWD. Currently, target animals must be euthanized in order to collect tissue for analysis. Commission staff will continue to monitor deer and enforce the new captive cervids rules as long as CWD remains a threat to the wild deer herd. Some may think the new rules are too strict, but the Commission takes seriously its responsibility to protect the state's wildlife resources. The Commission believes these rules will ensure the safety of our wild deer for the enjoyment of current and future generations of North Carolinians. ⊠

Kate Pipkin is an outreach specialist with the N.C. Wildlife Resources Commission.

Restrictions on importation of cervids.
No cervids may be imported into North Carolina for any purpose until the U.S. Department of Agriculture (USDA) establishes a CWD program that includes a test to detect CWD along with requirements for monitoring cervids that shall establish a basis for determining whether a cervid and any cervid herd or farm on which the tested animal has resided has been free of CWD for five years, provided that the program, test and monitoring requirements are recommended for application to wild animals by the Southeastern Cooperative Wildlife Disease Study. All cervids imported into North Carolina must be identified with tags provided by the Commission.

Restrictions on transportation.
Any person wishing to transport a captive cervid must apply for a permit. Permits will be issued only for export out of state, transport to a slaughterhouse for slaughter or transport to a veterinarian for treatment. Cervids that exhibit clinical symptoms of CWD are ineligible for transportation.

Fence monitoring requirements.
The fence surrounding the facility must be inspected routinely and the fact of inspection recorded to ensure the stability and integrity of the structure. Fences must be kept in good repair at all times.

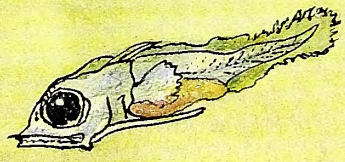
Tagging of individual cervids.
All captive cervids must be individually tagged in order to ensure that each animal is tracked and monitored for five years in a program approved by the Commission. The Commission's ability to verify a cervid's participation in a five-year monitoring program is essential to ensuring that the animal is free of CWD.

Reporting deaths.
All captive cervid deaths must be reported within 48 hours; those cervids that died at 6 months of age or older must be tested for CWD, regardless of cause of death.

For more information on CWD including text of the amended rules and a map of CWD outbreaks, visit our Web site at www.ncwildlife.org

How long can fish live? How fast do they grow? Why should we care?

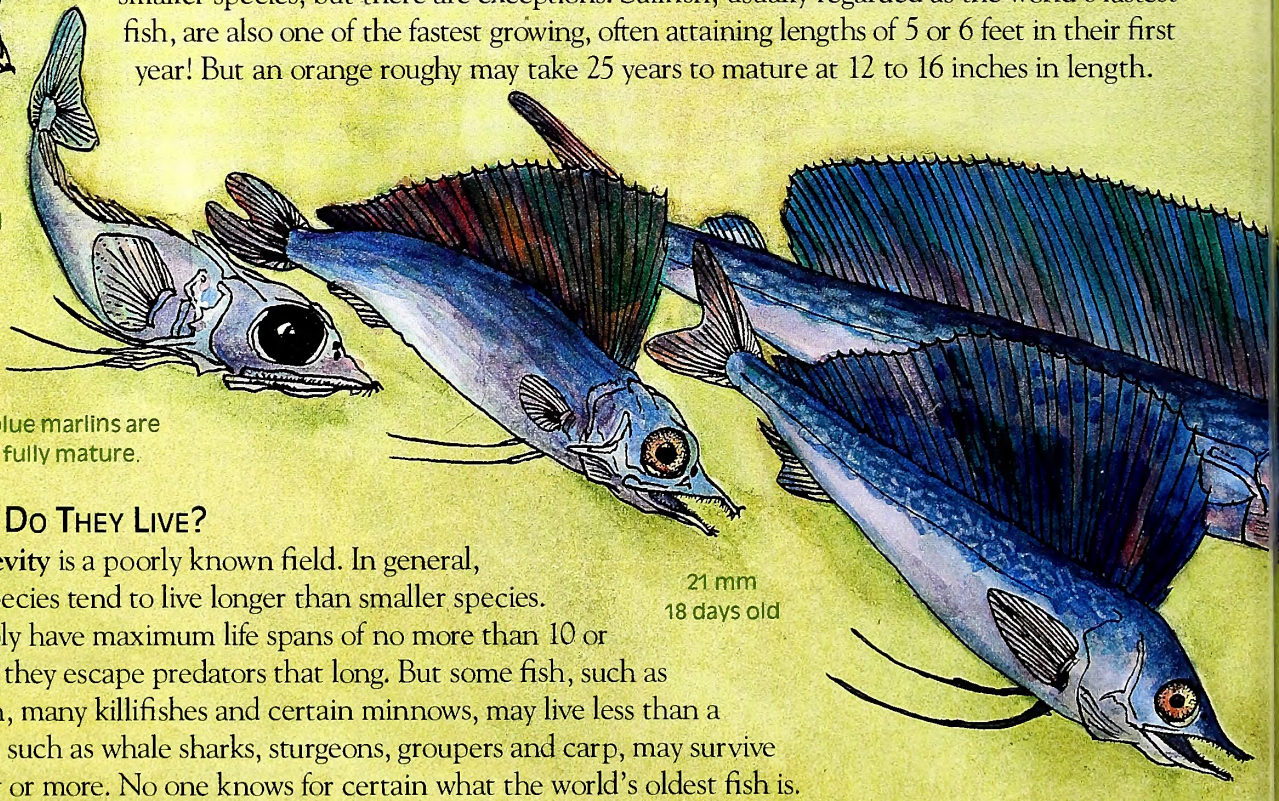
Age and Growth in Fishes



written by Jeff Beane / illustrated by Patricia Savage / nature activity by Anne M. Runyon

How Fast Do Fish Grow?

What if you kept getting taller every year of your life? If people grew the way fish do, the NBA might consist primarily of senior citizens. Unlike mammals and birds, fish grow continuously throughout their lives. They usually grow more slowly as they get older, and growth rates vary between species. Some fish reach adult size in a few months. Others may take decades to mature. Larger fish species often grow and mature more slowly than smaller species, but there are exceptions. Sailfish, usually regarded as the world's fastest fish, are also one of the fastest growing, often attaining lengths of 5 or 6 feet in their first year! But an orange roughy may take 25 years to mature at 12 to 16 inches in length.

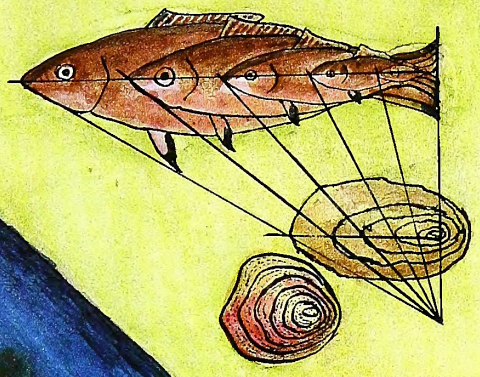


How Long Do They Live?

Fish **longevity** is a poorly known field. In general, larger fish species tend to live longer than smaller species. Most probably have maximum life spans of no more than 10 or 15 years—if they escape predators that long. But some fish, such as mosquitofish, many killifishes and certain minnows, may live less than a year. Others, such as whale sharks, sturgeons, groupers and carp, may survive for a century or more. No one knows for certain what the world's oldest fish is. Aquariums have not existed as long as zoos, so there are few documented instances of captive fish living to extreme ages. But there are other ways of determining a fish's age.

By 365 days old, an adult blue marlin wil be about 2 meters long. One of our fastest growing fishes, it grows from a 1 mm egg to 2 meters in one year.

Biologists can measure fish growth by ridges formed every year on a fish scale.



cycloid scale

ctenoid scale

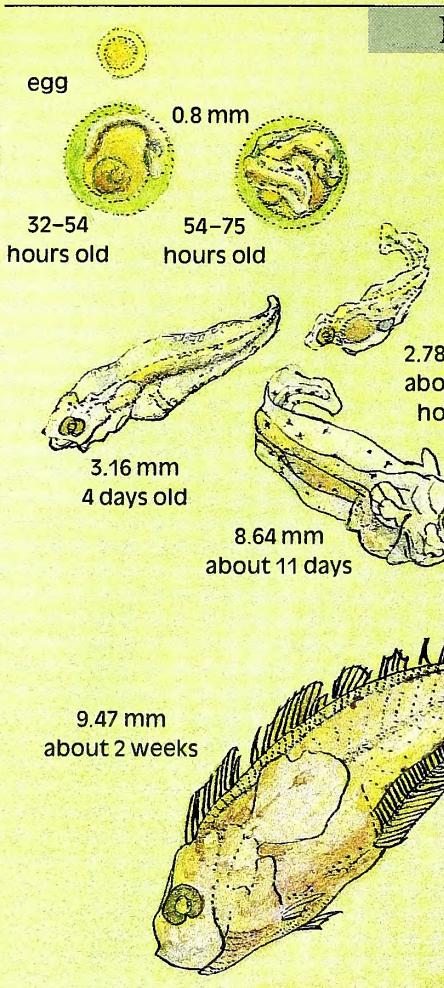
Aging Fish

Biologists can determine the age of bony fishes by examining certain bony structures, such as vertebrae, spines, **opercular bones**, scales and **otoliths**. When bones or scales grow, they form thin, visible layers called **circuli**. When growth is rapid, as during warmer months, the circuli are widely separated, forming a light band. During winter, when water temperatures are cooler and fish feed less, growth is slower, and the rings are crowded close together, forming a darker band. Normally a pair of bands—one light and one dark—forms an **annulus**, indicating a year of growth. For most fish with **cycloid** or **ctenoid** scales, growth rings can be counted by examining a scale, and a biologist can remove a scale without harming the fish. For scaleless species such as catfish, a cross-section of a spine may be used instead. In some fish species, growth annuli on scales can be difficult to see, and they may be affected by factors other than seasonal changes. In such cases, certain bones, especially otoliths, may form clearer annuli than scales, providing a more accurate age estimate. But using them requires sacrificing the fish. Collecting otoliths also requires more time and skill than removing scales. These methods are also ineffective for **cartilaginous** fishes such as sharks and rays.

20 cm
(201.4 mm)
38 days old

Tagging studies are useful for learning about age and growth in fishes. Biologists may attach numbered tags to fish externally or implant tiny transponder tags, which may be read with an electronic scanner. Tagged fish of known age and size can be weighed and measured again if recaptured to help determine natural growth rates.

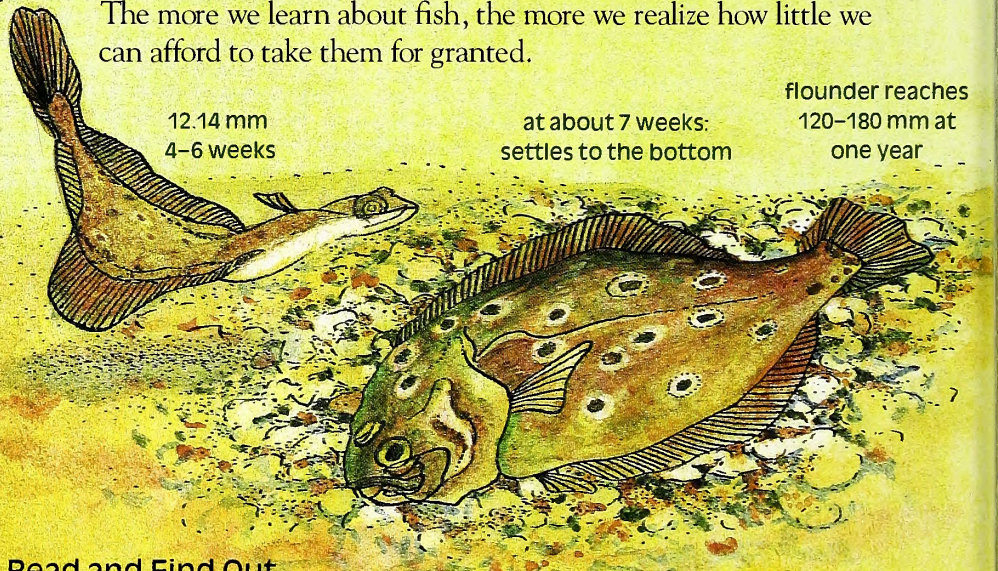
For fish occurring in tropical regions, or those kept in aquariums at constant year-round temperatures, age determination is more difficult.



WHY IT MATTERS

People have always enjoyed catching and eating fish. They form an important part of our diet, culture and heritage. In the past, we treated fish like a limitless resource. Lakes, rivers, streams and especially oceans seemed too vast to ever run out of fish. But in recent years, fish declines—including the virtual collapse of fisheries for such important species as cod, haddock, swordfish, grouper and bluefin tuna—have forced us to realize that fish populations cannot withstand unregulated harvest.

In order to manage fish populations, biologists need to know how fast individuals grow, at what age they mature, how often they reproduce and how long they are capable of living. A healthy fish population has a good ratio of older fish to younger ones. Some species grow slowly and have such low **fecundity** that their populations can withstand very little harvest. Populations of slow-growing species such as sturgeons and sharks take many years to recover once depleted. Individuals, especially mature females, are very important to those populations. Such species must be carefully managed to ensure their continued survival—for their benefit and ours. The more we learn about fish, the more we realize how little we can afford to take them for granted.



What Does It Mean?

longevity: maximum life expectancy
opercular bones: bony plates covering a fish's gills
otoliths: "earstones;" small, flat-oval bones found inside the heads of bony fishes
circuli: small ridges of bone forming a circular growth pattern
annulus: a growth ring or band representing one year of growth
cycloid: smooth scales with no spines on the exposed surfaces
ctenoid: scales with tiny spines on the exposed posterior surfaces
cartilaginous: having a skeleton composed primarily of cartilage, as in sharks and rays
fecundity: reproductive potential; fertility

Read and Find Out

- *A Field Guide to Freshwater Fishes, North America North of Mexico* by Lawrence M. Page and Brooks M. Burr, Houghton Mifflin, 1991.
- *The Freshwater Fishes of North Carolina* by Edward F. Menhinick, North Carolina Wildlife Resources Commission, 1991.
- *Freshwater Fishes of the Carolinas, Virginia, Maryland and Delaware* by Fred C. Rohde et al., University of North Carolina Press, 1994.
- "Song for the Swordfish" and "The Audubon Guide to Seafood" by Carl Safina, and "Swimming With Sharks" by Peter Benchley, in *Audubon*, May-June 1998 (special issue on declining fish populations).

In *Wildlife in North Carolina*:

- "Meet Fisheries Biologist Shari Bryant!" August 1998.
- "Tuna Online" by Chris Powell, December 2001.

Get Outside

Next time you catch a fish or see a live wild or captive fish, think about how old it might be. If you scale a fish to eat, save a scale and hold it up to the light or examine it under a microscope if you can. Can you see the light and dark bands indicating seasonal periods of growth? Can you estimate the fish's age? Can you see how it might be difficult to do so?

The three North Carolina aquariums (at Roanoke Island, Pine Knoll Shores and Fort Fisher) are great places to observe a wide variety of fish species up close. The North Carolina Zoological Park and the North Carolina State Museum of Natural Sciences also have live fishes on exhibit.

Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at **www.ncwildlife.org** and click the link for **education/workshops**.

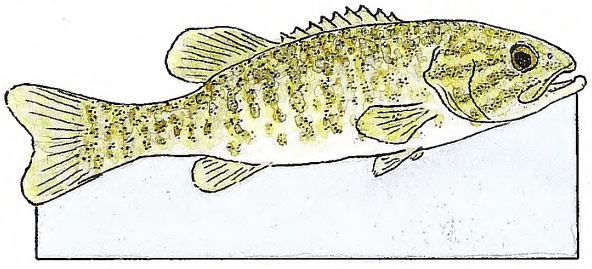
It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

Fishy Who's Who teaches students to recognize and identify major species of freshwater and saltwater fish in their area.

Fashion a Fish teaches students to understand how body shape and coloration can help fish adapt to their particular habitats.

Two Smallmouth Bass . . . Does Bigger Mean Older?



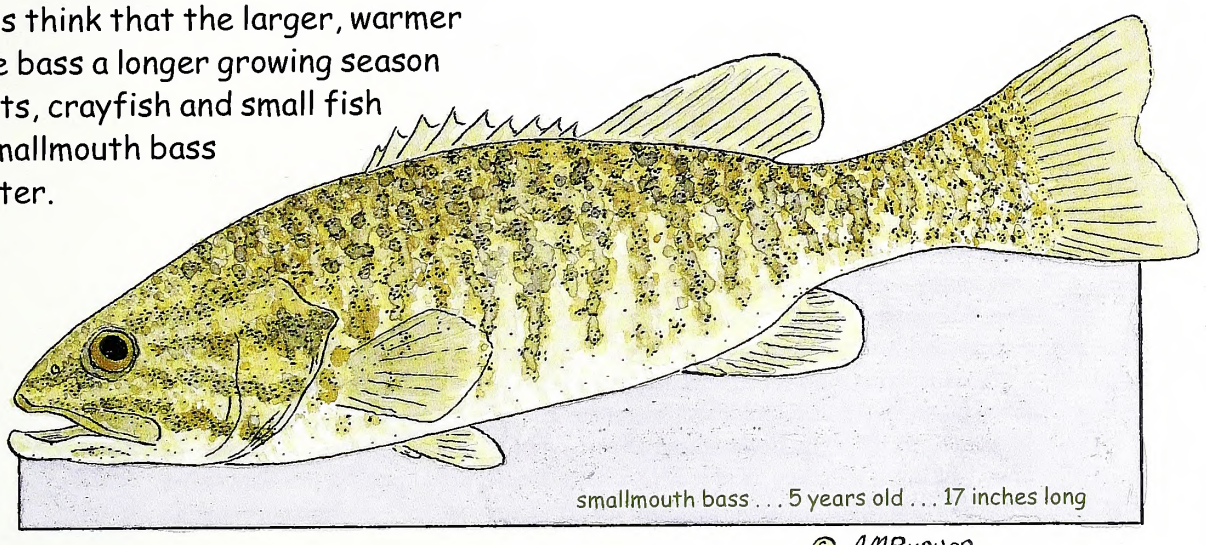
smallmouth bass . . . 5 years old . . . 8 inches long

Fish keep growing throughout their lives, but habitat can affect an individual's growth rate.

In 1973, researchers observed that the smallmouth bass living in a small, cool stream grew to a length of 8 inches in five years.

The smallmouth bass living in a larger, warmer stream grew to a length of 17 inches in the same five years. These fish grew more than twice as long. Why?

The researchers think that the larger, warmer stream gave the bass a longer growing season with more insects, crayfish and small fish to eat. These smallmouth bass simply grew faster.

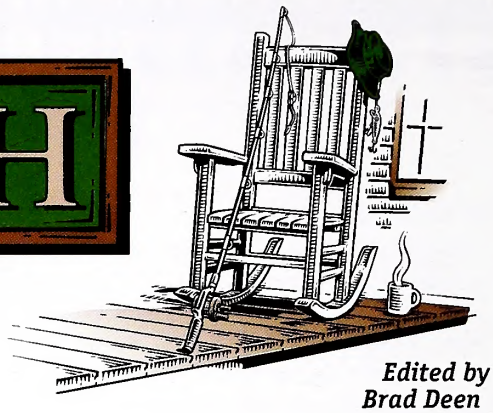


smallmouth bass . . . 5 years old . . . 17 inches long

© A.M.Rungon

BACK PORCH

News and Wildlife Notes



Edited by Brad Deen

Winter Turkey Season Approved

WILLIAM S. LEA

***Resumption of a** cold-weather hunting season for wild turkeys in North Carolina is due to 30 years of careful management.*

Hunting to Start Next January

Hunters eager for a winter wild turkey hunt can look forward to next year.

Culminating 30 years of a successful wild turkey restoration program in North Carolina, the N.C. Wildlife Resources Commission has added a six-day winter turkey season to the hunting calendar. The state's first cool-weather turkey season since 1972 will be Jan. 12-17, 2004, on private lands in nine northern counties: Alleghany, Ashe, Caswell, Granville, Person, Rockingham, Stokes, Surry and Watauga. Those counties have the highest densities of turkeys, as well as the highest spring harvest levels per square mile of habitat. The only hunting allowed on public lands will be at the Caswell Game Land through a permit draw.

The bag limit for the winter season and spring season combined will be two birds, only one of which can be taken during the winter season. The winter season will be an either-sex hunt. The regulations allow the use of dogs. There is no baiting for turkeys during either season.

The spring 2004 season dates will be April 10 through May 8. As in past years, the spring season will continue to be bearded turkeys only. No dogs may be used. This year, the spring season will be open in all counties, with the exception of Wilson.

"The commission appreciates turkey hunters who commented at our public hearings and the sportsmen who responded to our mail survey," said Richard Hamilton, chief deputy director of the Wildlife Commission. "We used this feedback along with sound science to craft our changes to the turkey season. We feel these new regulations expand hunting opportunities within the capacity of the resource to support a controlled harvest."

Another turkey hunting proposal, a youth-only turkey hunting day, did not receive commission approval. Extensive public comments indicated that a Saturday before the regular start of the spring season—not the Saturday after the season ends, which was proposed for the 2003-2004 season—would be a popular date for youth hunting. The Commission agreed to consider an alternate day for youth-only turkey hunting during the 2004-2005 season's regulations review.

The full text of all regulations changes for the 2003-2004 season is posted on the commission's Web site, www.ncwildlife.org.

New Nontoxic Shot Approved for Waterfowl Season

Hunters will now have a choice of eight nontoxic shots when the 2003 waterfowl season rolls around.

In January the U.S. Fish and Wildlife Service granted permanent approval to the HEVI-SHOT brand from ENVIRON-Metal. The formulation of tungsten, iron, nickel and tin (TINT) passed toxicological studies and other evaluations.

Lead shot for waterfowl hunting has been illegal since 1991 because of the possibility of waterfowl ingesting lead pellets and contracting lead poisoning. A recent study by Illinois researchers concluded that just for the 1996 and 1997 hunting seasons, the ban on lead shot reduced lead poisoning deaths of mallards by 64 percent, while overall ingestion of toxic pellets declined by 78 percent over previous levels. The report concludes that by significantly reducing lead shot ingestion in waterfowl, the ban prevented the lead poisoning deaths of approximately 1.4 million ducks in the 1997 fall flight of 90 million ducks.

MELISSA McGAW

Report: 131 Bird Species Need Conservation

The U.S. Fish and Wildlife Service is trying to conserve birds before they wind up on the endangered species list.

The federal agency recently released its "Birds of Conservation Concern 2002" report, which identifies 131 species that deserve prompt conservation attention to stabilize or increase populations or to secure threatened habitats. For the Southeast, the list includes dozens of species of raptors, shorebirds and migratory songbirds. Even the red-headed woodpecker made the list because of disappearing forests.

"We need to do more to protect declining species before they become threatened or endangered," said Interior Secretary Gale A. Norton. "This list will help the Fish and Wildlife Service work in partnership with states, conservation groups and others with an interest in bird conservation to take action now to keep species from declining to the point of requiring listing under the Endangered Species Act. It provides a road map for conserving hundreds of bird species across the country that have suffered habitat and population losses."

The list prioritizes species based on the threats they face and the declines they have suffered. Criteria included declining or uncommon species, small ranges or significant threats to the species' future survival. Listed birds can be given priority consideration for research, monitoring and management funds.

The development of an "early warning" list of bird species in potential trouble is mandated by federal law. The number of such species has grown from 30 in 1987, to 122 in 1995 and to the present 131.

The report was developed in consultation with Partners in Flight, the North American Waterbird Conservation Plan and the U.S. Shorebird Conservation Plan. Copies are available by writing to the Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Mail Stop 4107, Arlington, VA 22203-1610, ATTN: BCC 2002. Or log onto http://migratorybirds.fws.gov.

TERRY SHANKLE

***The saw-whet owl** is one of 131 "Birds of Conservation Concern" because of declining populations.*

MELISSA McGAW

More than 80 saltwater fishing and boating enthusiasts gathered in Florida to request that federal regulators fish or cut bait on recreational issues.

Spearheaded by the American Sportfishing Association, the February conference sought collaboration with officials of the National Oceanic and Atmospheric Administration in marine policy-making that would better represent the agency's recreational fishing and boating constituency.

"We had a lot of ground to cover on several long-standing issues," said Mike Nussman, president and CEO of the sportfishing association. "Everyone demonstrated a strong commitment to work together to keep our ocean fish healthy and protect the fishing and boating experience."

Topics that recreational saltwater users presented to federal officials included allocations for commercial and recreational fishing; representation on the eight regional fisheries management councils with responsibility for ocean fisheries and those that migrate inland; and the role of marine protected areas in marine management. The association also urged NOAA, which is under the Commerce Department, to create an office dedicated to recreational fishing and boating issues.

"From Alaska to Florida, the saltwater community was united on the common issues that need addressing," said Nussman. "The challenge is there's still a lot of work to be done on our end, too."

The American Sportfishing Association is a coalition of sportfishing and boating industries, state fish and wildlife agencies, federal land and water management agencies, conservation organizations, angler advocacy groups and outdoors journalists.

Live and Let Live

Wildlife through the Year

Like the beginning of a stock car race, I can almost smell the gasoline and anticipation as millions of homeowners fire up their lawn mowers for the first cuts of the year. The old truisms of spring still apply, with rebirth, renewal and creation channeling themselves through a singular impulse to create the perfectly manicured yard.

I count the urge among the primal instincts dating back to the agrarian past from which most of us have been removed. We must grow, care for and harvest our grass; that is the way.

But not for me—at least when it comes to my backyard. For the first time since I moved into my house, I have decided not to maintain a sizeable chunk of my acreage. No raking, mowing, fertilizing—nothing. It's an easy sell for my conservationist side. The yard backs up to a lush riparian area, so additional vegetation will better filter runoff that eventually finds its way to the Neuse River. And of course, the wildlife just loves my new laissez-faire attitude. The view from my deck increasingly looks like a scene from *Wild Kingdom*.

Even so, my agrarian side still agonizes over leaves that need to be blown, grass that must be cut and saplings that should be chopped. Just think of all that Bermuda needlessly suffocating beneath the mat of leaves. And what will the neighbors say?

Oh, who cares? When it comes to the backyard, my cause is righteous and my course is true. But now the front yard: That's a different story.

—*Chris Powell*

On Patrol

Alligators don't turn up in the mountains often, but Wildlife Enforcement officers found three far from their native swamps last spring. A Transylvania County reptile dealer advertised young alligators, 24 to 30 inches long, for sale on his Web site. Although American alligators are no longer considered an endangered species, they remain on the federal threatened list, and their sale is forbidden. Hearing of the Internet offer, Wildlife Sgt. Robert Hebb called the seller and set up a sting, saying he wanted to buy a baby gator for his wife.

Arriving at the house, Hebb spied a large rat in the yard, scurrying underneath a parked car. The reptile trafficker explained that he had bought 50 rats to feed his snakes. He had stored the rats in a large, plastic garbage can, but they chewed out of the can. Neither the dealer nor his wife seemed to mind the infestation, saying the worst problem had been removing the rats from the walls by tearing out paneling.

ILLUSTRATED BY JACKIE PITTMAN

The baby alligators were indoors, inside an 8-foot aquarium. Hebb bought one, paying cash. The dealer gave him a receipt. Driving away, Hebb called in uniformed officers to close the deal. The reptile dealer was fined $1,000 and ordered to pay $100 court costs. The alligators were released into their natural habitat.

DERRICK HAMRICK

Wildlife-Related Recreation Remains Strong

Wildlife-related recreation is among the most consistently popular activities in the country, according to a recent report by the International Association of Fish and Wildlife Agencies.

More than 80 million Americans participate in hunting, sportfishing and wildlife watching. In 2001, Americans spent more than $110 billion on those activities—an amount equaling 1.1 percent of the gross domestic product. More than 31 percent of the national population photographed or observed wildlife, spending $40 billion to do so in 2001.

In North Carolina, retail sales from hunting and sportfishing activities generated nearly $1.6 billion and produced a ripple effect in the state's economy of more than $3.2 billion. A total of 34,903 jobs in the state were created as a direct result of hunting and sportfishing, producing salaries and wages of more than $813 million.

"Fishing, hunting and wildlife watching are very traditional and rewarding activities for Americans," said Richard Hamilton, assistant director of the N.C. Wildlife Resources Commission. "In North Carolina, these activities contribute significantly to the state's economic well-being. Every time an angler buys a rod and reel or a hunter purchases a license or a boater registers his vessel, our state's wildlife benefits."

The survey results are based on data collected by the U.S. Bureau of Census and developed by the U.S. Fish and Wildlife Service, with the assistance of state fish and wildlife agencies, related industries and national conservation organizations. The national report can be found at http://federalaid.fws.gov/surveys/surveys.html. Details by state are available at www.IAFWA.org.

Monarchs Flourish Despite Hard Freeze

WILLIAM S. LEA

Monarch butterflies are surprising researchers with a remarkable comeback from last year's extreme weather that killed the fragile insects by the millions.

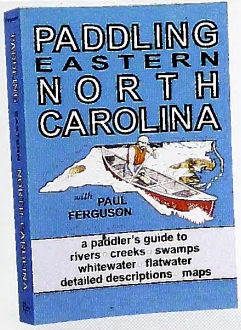
Estimates of the deaths ranged upwards of 500 million, or 75 to 80 percent of the monarch flight. The butterflies migrate each fall down the Eastern Seaboard, from Canada to the Sierra Mountains of central Mexico. There they spend the winter hanging in oyamel fir-tree groves that total less than 20 acres. Scientists don't fully understand what guides generations of butterflies to the same place each year.

In their wintering grounds last year, the butterflies encountered actual winter—hard rains and freezing cold. Leaving Mexico in spring to return north, the monarchs encountered drought across much of eastern North America. By the time of the fall flight, volunteers reported far fewer monarchs.

But they arrived in Mexico en masse. An estimated 200 million to more than 500 million monarchs are now hanging in their habitual enormous clusters in the Sierra fir forests.

"It's a little bit of a mystery," said Chip Taylor, director of Monarch Watch. "There's obviously something we really have to learn about where these butterflies come from and how successful they are. But it's quite clear that they have recovered."

Illegal logging in and around the Mexican government-protected butterfly reserve has drastically reduced the monarch's habitat. Between 1971 and 1999, 44 percent of the high-quality forests where butterflies hibernate was degraded.



Book Review: Paddling Eastern North Carolina

Outdoor recreation is growing in popularity as people discover its health and emotional benefits. At the same time, conservation of vast tracts of the Coastal Plain is introducing to many the natural bounty of inland North Carolina.

Paddling Eastern North Carolina covers both territories. Avid canoeist and kayaker Paul Ferguson presents detailed, firsthand knowledge about 2,600 miles of navigable waterways from the foothills to the coast. The book is packed with maps and outlines of paddling trips, which vary greatly by length and by ability required. Although Ferguson designates some waterways as suitable for beginners, he advises novice paddlers to start with a book on technique or to take a paddling course. But even experienced paddlers would do well to heed his warning about the consequences of overconfidence:

"Without the knowledge of existing hazards, experience to evaluate river conditions and knowledge of one's paddling ability, the 'accident' is almost assured. The only question is how serious will it be?"

One potential disappointment to readers is a lack of scenic description and natural lore from Ferguson's 2,600 miles of paddling. Although he rates each stretch of water for scenery, depending on how unspoiled or commercially developed it is, much of the text merely lists launch or take-out points, hydrologic details and available camping facilities, as well as any known hazards. But the omission of plant and wildlife details from a book that already runs to 500 pages is no shortcoming. Ferguson provides the means for anyone to discover the overlooked natural wonders of central and eastern North Carolina—less spectacular than the coast or mountains, perhaps, but no less wondrous to those who appreciate the homely virtues of wide rivers, blackwater creeks and bottomland swamps.

—*Brad Deen*

Paddling Eastern North Carolina by Paul Ferguson, Pocosin Press, paperback 2002, $19.95; available from bookstores, outfitters or the publisher: (919) 781-3080, www.pocosinpress.com.

IT'S THE LAW: Children Must Wear PFDs

Children under age 13 must now wear a life vest while boating, according to the U.S. Coast Guard.

The new Coast Guard boating-safety rule automatically becomes state law, applying to all public waters of North Carolina. It requires any child under age 13 to wear a Coast Guard-approved personal flotation device, or PFD, if the boat is under way—that is, not anchored or tied to shore. The only exceptions are for children who are below deck or inside an enclosed cabin.

Previously, boating regulations required only that PFDs of the proper size and in good condition be aboard the boat and accessible to children. The new law does not apply to commercial vessels.

The intent of the new law is to reduce the number of children who drown every year because they were not wearing lifejackets. National figures show that from 1995 to 2001, 210 children under age 13 died while boating—121 of them from drowning.

Nature's Ways

The Littlest Frog

written by Jeff Beane
illustrated by Jim Brown

North Carolina's Coastal Plain is home to the smallest amphibian in North America. With a maximum length of 0.7 inch, the little grass frog (*Pseudacris ocularis*) makes a spring peeper look large. This elfin amphibian's relationship to other hylid frogs is controversial. Formerly placed in the genus Hyla with the tree frogs, then in its own genus, Limnaoedus, it is now included in Pseudacris with the chorus frogs.

Like many frogs, the little grass frog is more often heard than seen. Its insect-like "pt-zeee!" is so high-pitched that some people have trouble hearing it. Most breeding occurs after heavy rains in late winter, spring and summer. But the species has been heard calling during most months, and it may be capable of year-round breeding.

Like many amphibians, it depends on ephemeral wetlands, utilizing everything from tire ruts and roadside ditches to Carolina bays. Unlike most frogs, it deposits its eggs singly, and they are difficult to find. Adults are likewise seldom encountered, even by those patient enough to search breeding choruses by flashlight or to sweep grassy ditches with an insect net.

Too many organisms are ignored because of small size or secretive habits. The little grass frog is just one example of an overlooked creature that does its job well and ought to be better known.

Calendar of Events

TUESDAY, APRIL 29 AND MAY 6

Ecology and Management of Migratory and Resident Birds is the subject of two workshops sponsored by the Forestry Educational Outreach Program of N.C. State University. The courses will be in New Bern on April 29 and Durham on May 6. Continuing education credits are available. Call (919) 515-3184, or log onto www.ncsu.edu/feop.

THURSDAY MAY 1, 8 AND 22

North Carolina Partners in Flight will hold workshops on identifying and monitoring birds, to be conducted by Wildlife Commission bird biologist Mark Johns. Courses will be at Howell Woods in Johnston County (May 1, 8) and along the Blue Ridge Parkway near Asheville (May 22). Call (919) 852-5124, e-mail johnsme@mindspring.com, or log onto http://faculty.ncwc.edu/mbrooks/pif/index.html.

SATURDAY, MAY 3

A wooden boat show at the Beaufort waterfront will feature classic craft for exhibits and races. Call (252) 728-7317, or log onto www.ah.dcr.state.nc.us/sections/maritime/default.htm.

SATURDAY, MAY 10

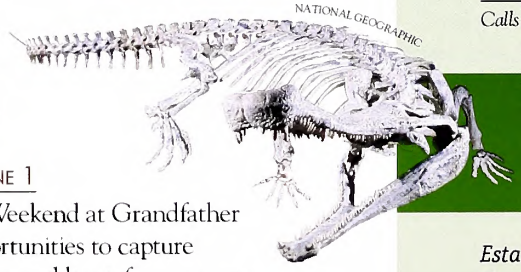
Migratory Bird Day at the N.C. Zoological Park in Asheboro will feature presentations and activities relating to migratory bird species. Call toll-free (800) 488-0444, or log onto www.nczoo.org.

SATURDAY, MAY 17

The Trees of Chimney Rock Park will be the subject of a guided hike at the facility. Call toll-free (800) 277-9611, or log onto www.chimneyrockpark.com.

THROUGH MONDAY, MAY 26

SuperCroc at the N.C. Museum of Natural Sciences in Raleigh is a traveling exhibit from National Geographic. *Sarcosuchus imperator*, the 110-million-year-old relative of today's crocodiles, measured 40 feet long; just its jaws were a fearsome 6 feet long with more than 100 teeth. Log onto www.naturalsciences.org, or call (919) 733-7450.



FRIDAY, MAY 30–SUNDAY, JUNE 1

A Nature Photography Weekend at Grandfather Mountain will offer opportunities to capture spectacular scenery by day and learn from nature photographers by night. Call toll-free (800) 468-7325, or log onto www.grandfather.com.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to greg.jenkins@ncwildlife.org, or call (919) 733-7123, Ext. 264.

Grant to Help Save Rare Fish

PROGRESS ENERGY

A $10,000 grant from Progress Energy, formerly CP&L, will help the N.C. Museum of Natural Sciences troll for data in preserving a rare fish.

The Carolina redhorse, a species of sucker that grows to 22 inches or more, has been found in two of Progress Energy's hydroelectric reservoirs, Blewett Falls Lake and Lake Tillery located on the Yadkin-Pee Dee River. The Carolina redhorse was unknown to science until the mid-1990s. It does not even have a scientific name yet.

The fish was able to escape detection until recent years due to its secretive habits and depleted populations. It appears to have been eliminated from much of its range, with remaining populations restricted to portions of the Pee Dee and Cape Fear river basins, mostly in North Carolina.

"This gift from Progress Energy gives us a great opportunity to move ahead with much-needed studies to protect this rapidly disappearing species," said Wayne Starnes, the museum's curator of fishes. Among the projects planned are surveys of portions of the Cape Fear and Pee Dee basins to assess Carolina redhorse population status in those areas, as well as in previously known locales. DNA sequencing will be performed on redhorse specimens collected from the Cape Fear and Pee Dee basins to compare genetic patterns and determine if the fish differ sufficiently to warrant separate management plans.

"Progress Energy believes in being a good environmental steward," said John Crutchfield, a biologist with the company, "and with this research grant, we hope to learn more about this fish and its life history to provide knowledge for management of the Yadkin-Pee Dee River population."

Catch Us at these *Numbers*

1-800-662-7137 to report violations of hunting and fishing laws
1-800-628-3773 (NC VESSEL) for boat registration and titling
1-800-675-0263 for hunting dates and shooting hours for migratory game birds
1-888-248-6834 (2HUNTFISH) to purchase most licenses with VISA or MasterCard using a touch-tone telephone
1-800-446-8663 (I GOT ONE) to report big game harvests
Connect to the Wildlife Commission's online Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

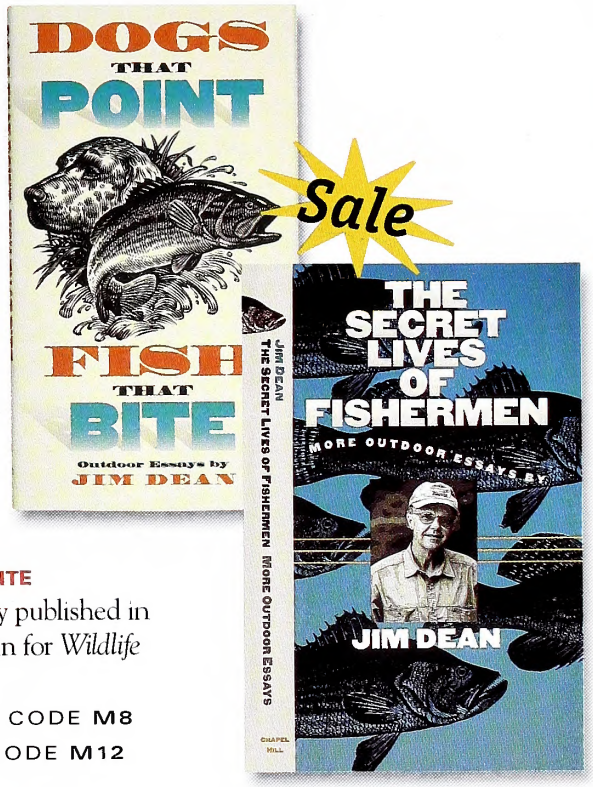
Wildlife Endowment Fund Report

Fund Balance $51,312,097.19

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

N.C. WILD STORE

TWO for the road . . .



Travel far afield with a seasoned storyteller. Jim Dean's hunting and fishing stories evoke the reverie of wild places and the simple pleasures of rural life. Each of these two book-length collections represents some of his best writing, arranged to follow the course of a year outdoors.

DOGS THAT POINT, FISH THAT BITE
A collection of 50 essays originally published in Dean's "Natural Heritage" column for *Wildlife in North Carolina* magazine.
Hardbound ~~$19.95~~ $14.95 ITEM CODE **M8**
Paperback ~~$10.95~~ $8.00 ITEM CODE **M12**

THE SECRET LIVES OF FISHERMEN
Thirty-nine essays about life as a fisherman written for outdoor magazines.
Hardbound ~~$24.95~~ $18.50 ITEM CODE **M13**

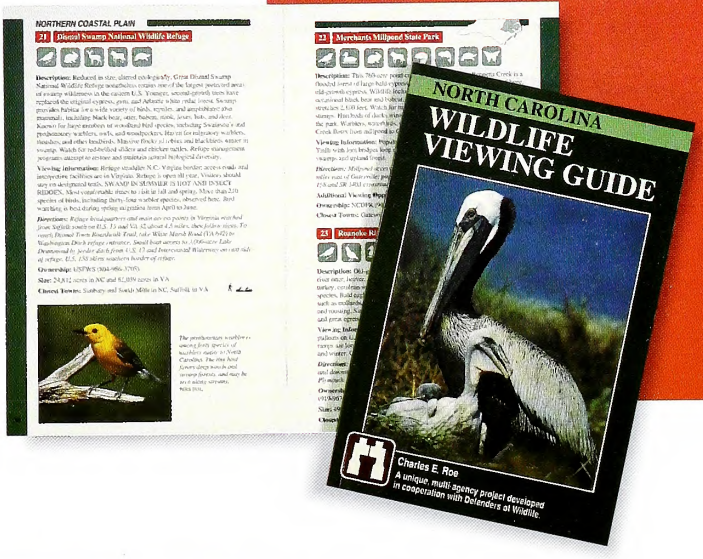
SET OF BOTH VOLUMES
With this special offer, you can add to your library and remember friends too.
Hardbound $30.00
ITEM CODE **M14**

"It's best to leave around 6:30 in the morning while it's still cool and the traffic is light. Head east and pick the back roads where you can drive 45 miles an hour or less without holding up a long line of traffic. Roll down the window and listen to the buzz of insects in the fields and ditches as you pass."

—The Secret Lives of Fishermen

Enjoy the VIEW

Wherever your travels lead, take along the *North Carolina Wildlife Viewing Guide*. Directions to 90 of the state's best locations for seeing wildlife include maps, observation tips and habitat notes. And if you're interested in a particular species, this guide tells you when and where it's most frequently seen.



NORTH CAROLINA WILDLIFE VIEWING GUIDE
$5.95 ITEM CODE **N6**

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a standout in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

▲ **Largemouth Bass.** Add some history to your fishing trips with our bass tee. This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12XLG** (extra large)
A12LRG (large) **A12XXL** (extra extra large)

left front design

▲ **Snow Geese.** Our waterfowl tee recalls times past, when the Cape Hatteras lighthouse stood close to Diamond Shoals. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front. Celebrate conservation efforts with this white, all-cotton tee.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo. Grab a gobbler with this tan, all-cotton tee.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail their quarry and some that tree as well.
Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams.
Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

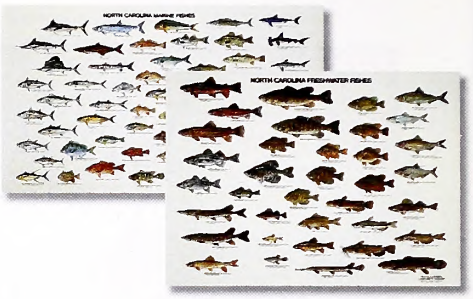
Nature's Ways Collection ▲

If you're looking for drama and science combined, "Nature's Ways" essays from *Wildlife in North Carolina* will deliver. Includes a new comprehensive index to all six volumes so you can find related essays easily.

Half-price while supplies last.

Boxed Set. $15 ITEM CODE M10

Unboxed set. $13.75 ITEM CODE M9



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE P9

Rivers of North Carolina ◀

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* published in Nov. 1999 chronicles the natural history of 17 major river basins in North Carolina. Travel from the Little Tennessee and the Hiwassee to the Roanoke and the Tar-Pamlico. It's a journey that will last a lifetime.

Half-price while supplies last.

$5 ITEM CODE M11

North Carolina WILD Places: A Closer Look ◀

Book and Posters Set.

Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a N.C. WILD Places map featuring the art of Jackie Pittman make this set a valuable teaching tool.

$16 ITEM CODE E6

Items not pictured:

All Things Are Connected

Video and Activity Guide. Based on Chief Seattle's 1855 speech, the film's focus is on environmental ethics. Accompanied by *This Land Is Sacred* teacher's guide, this film is a must-see for everyone. $22 ITEM CODE W3

Bird Houses and Feeders

This 8-page illustrated guide to building birdhouses includes construction notes and dimensions, as well as tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE M6

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE M2

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set.

$2 ITEM CODE M5

N.C. WILDlife Profiles Binder and Profiles Sets 1–12 ▲

This top-quality 3-ring binder includes:

- 120 illustrated fact sheets, each profiling an animal's history, status, habitat and behavior, and also containing a range map.
- Tab dividers that organize 12 sets of wildlife fact sheets by class.
- A table of contents, index and instruction sheet.

Half-price. $15 ITEM CODE W17

2002 Migratory Waterfowl Print and Stamp Set ▶

Dawn breaks, and a flock of pintails settles on the brackish waters of Pamlico Point. In the gray light, a father instructs his son to focus on just one bird before shooting. Signed by artist Ron Louque, "Traditions at Pamlico Point" will stir memories of a first hunt for many a waterfowler. Your purchase of this limited-edition set supports wetlands research and restoration. Overall size: 12" x 14"; image size 6 1/2" x 9".

This item not subject to 15% discount.

$145 ITEM CODE DSP02

WILDLIFE COMMISSION SPOTLIGHT

Sign of the Times

JODY DUGGINS

North Carolina boasts more streams capable of supporting trout than any other state in the Southeast. Even so, those opportunities have diminished due to privately owned lands becoming closed to public access. Between 1993 and 2001, 16 trout streams on private lands were removed from the N.C. Wildlife Resources Commission's trout management program due to "no trespassing" postings.

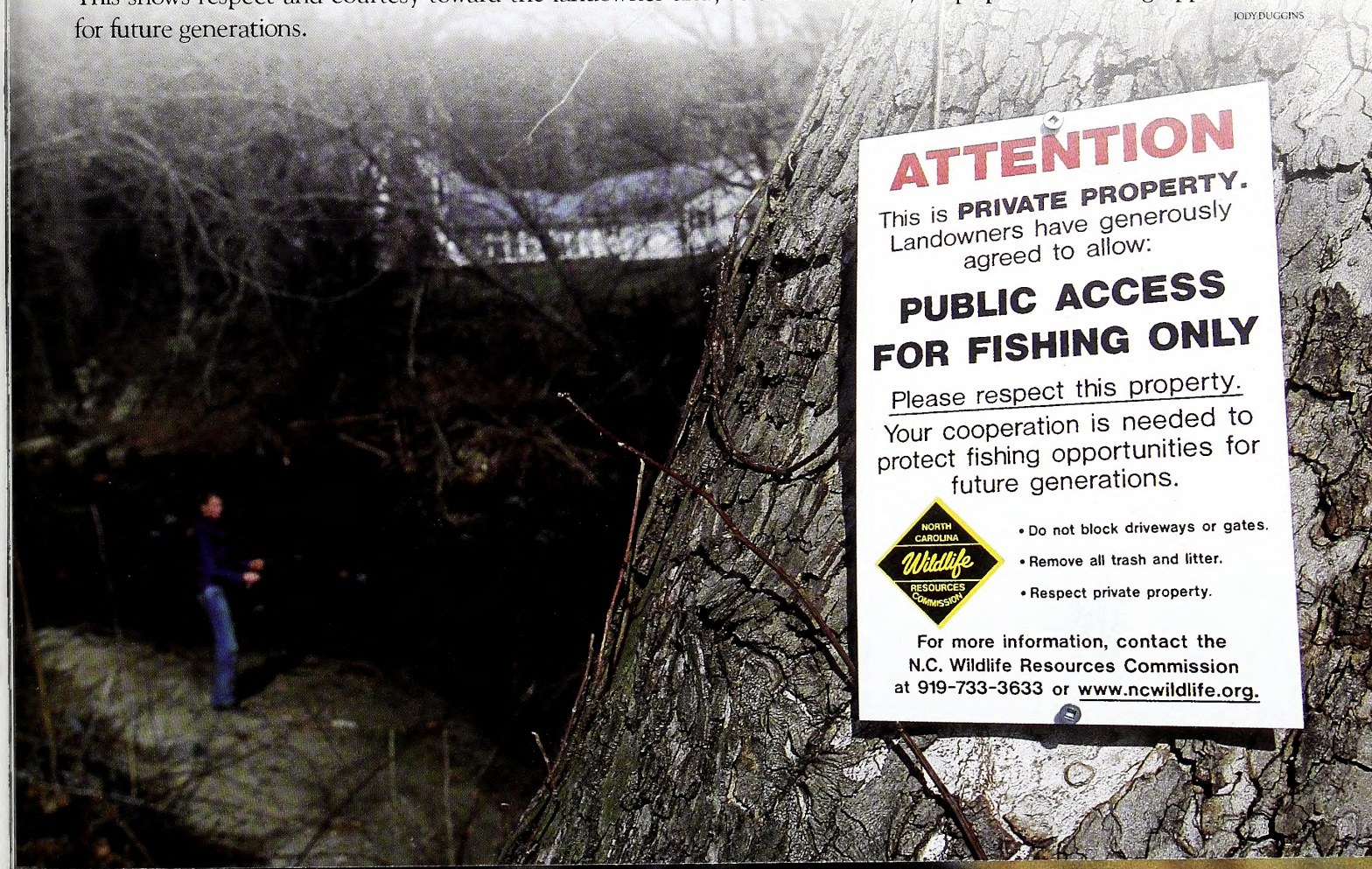
To stem the loss of those opportunities, Wildlife Commission fisheries biologists are working with private landowners in the state's mountain region to provide public fishing access in trout streams flowing through privately owned lands. Cooperating landowners have granted the commission permission to post signs marked "Public Access for Fishing Only."

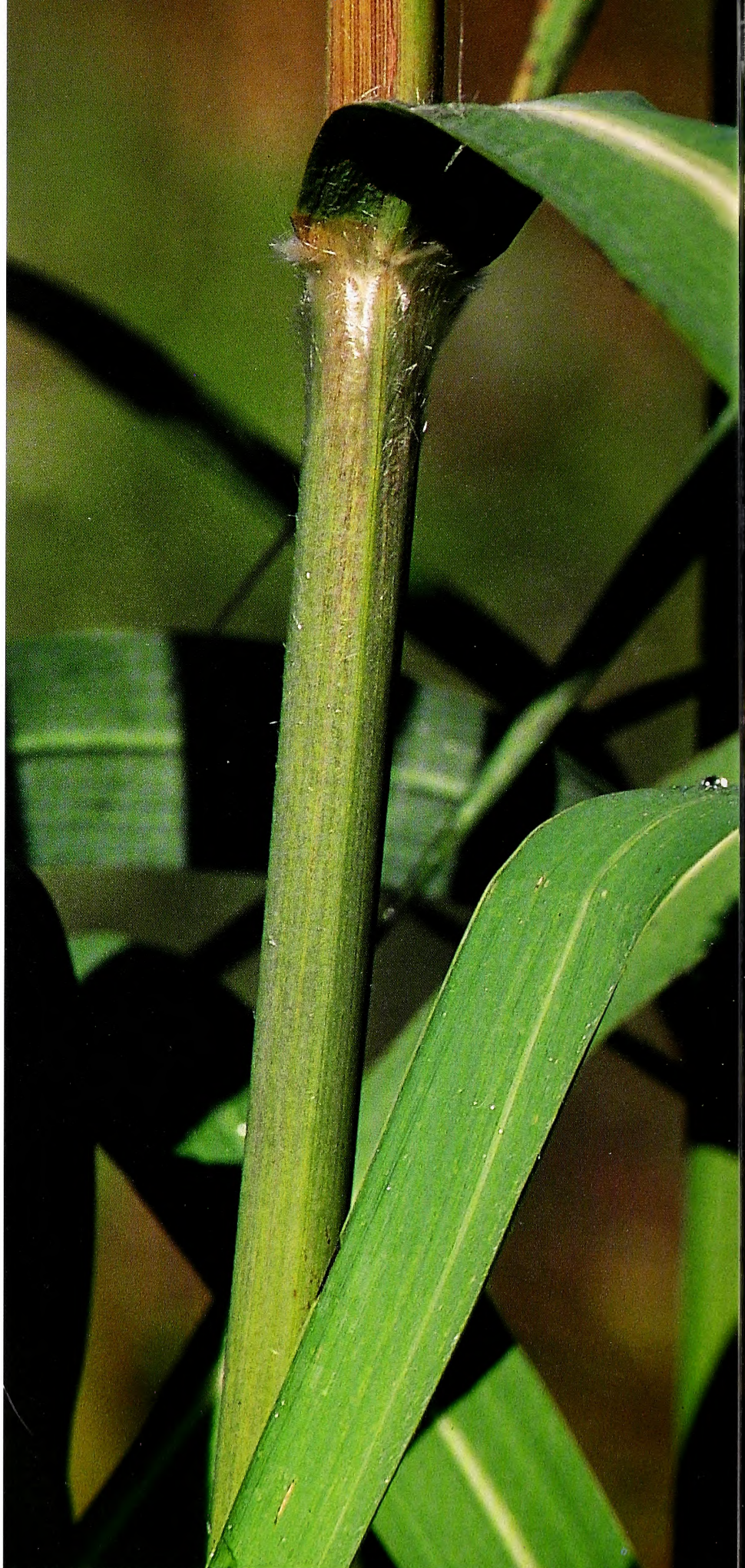
The signs remind anglers to act responsibly when fishing on privately owned lands—dispose of trash and litter, park only in designated areas, close gates and avoid blocking driveways.

About 40 percent of the 2,000 miles of publicly accessible trout streams are located on private lands. Public fishing opportunities on approximately 800 miles of North Carolina trout waters are dependent on the willingness of private landowners to continue allowing public access to those waters.

Anglers can help prevent the closure of additional streams by being courteous while fishing on private property. This shows respect and courtesy toward the landowner and, at the same time, helps preserve fishing opportunities for future generations.

JODY DUGGINS





Blending In

Many animal species—including the katydid—use stealth and camouflage to blend in with their surroundings. For more on spotting wildlife, see page 2.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

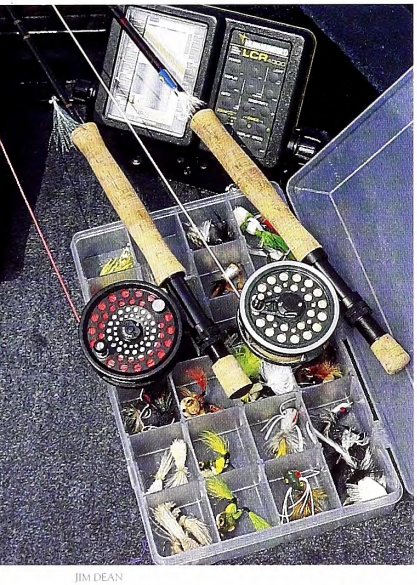
C45
7:67/6

WILDLIFE IN NORTH CAROLINA

JUNE 2003 $1.50

The Electric Angler

by Jim Dean



JIM DEAN

"If depth recorders are black magic, the Global Positioning System (GPS) is pure voodoo."

I once worked with a colleague who didn't want to own anything smarter than he was. He lived a largely pre-Industrial Revolution lifestyle, eschewing such innovations as computers, VCRs, microwave ovens, cell phones, digital cameras and even electric can openers and coffee makers. His bicycle had one speed. His boat was plywood and homemade, propelled by a pull-start Elgin and a paddle. He could tune up his 30-year-old carbureted automobile for $6.25.

"There is much to be said for simplicity," he frequently opined, though true to his calling—and because saying "much" would reinforce the oxymoron—he declined to elaborate. We tend to admire such self-reliant iconoclasts, believing they have plumbed the secrets of true contentment. Meanwhile, of course, we ignore their example and relentlessly pursue the cutting edge of technology—the result being that we wind up with no clue how most of our possessions work, much less how to fix them when they don't.

My relatively new boat is a superb example. I believe I understand how it floats (something about displacement of a hull full of lighter air being pinned against the surface by gravity above and the pressure of denser liquid beneath). Anyway, it floats when I remember to put the plug in. I can even fathom the principle of screw propulsion: It turns, I go. But much beyond that and I am at a loss. Everything on this boat is way smarter than I am.

Of course, that's not saying much. I never grasped the technology behind my first portable green box Lowrance Fish Lo-K-Tor bought in the 1970s, much less the pair of modern pixel-screened depth recorders I've added to my new rig. You push a button, and these things not only tell you the depth and temperature of the water, they reveal the contour and substance of the bottom, display the outlines of submerged stumps and even show individual fish by size. I'm more than happy to yield to this superior intelligence as long as that button works.

Even so, I'll bet I'm not the only soul who wonders about all those fish icons that show up on the screen. Have you ever spotted a juicy icon on your depth recorder, presented it with a bait or lure, and seen an icon eat it? Not me. Every time I see a screen full of fish, I am filled with doubt. Are those fish really down there, or did some enterprising engineer—secretly calculating how to spend his bonus—decide to program fish icons all over that screen like sprinkles on a hot fudge sundae? I can almost hear him explaining this to management: "They want to see fish, we'll show 'em fish."

If depth recorders are black magic, the Global Positioning System (GPS) is pure voodoo. For those who might not be familiar with this amazing technology, GPS uses satellites to plot your exact location. Though it has many applications, it is particularly useful to boat operators who tend to go places where there are no street signs or recognizable landmarks. Not only will GPS inform your rescuers of your whereabouts, it will help you safely chart a path through indistinct navigable channels in shoal waters and even record exact fishing spots so you can return to them.

Alas, my new GPS and I have a communication gap. It knows where I am, but I don't. I trace this in part to the fact that the portable model I bought came with an inch-thick instruction manual written by someone who apparently got a social promotion in English as a Second Language.

Figuring the open ocean might not be the best place to decipher the instructions, I decided to practice using my new unit in my neighborhood. Within a week, I could confidently walk half a block up the street and use GPS to retrace my steps. I wouldn't say that I achieved a high level of expertise, but I could get home by referring to the instructions (and occasionally looking at the house to get my bearings).

On my first trip to the Outer Banks with the new GPS, I made the disconcerting discovery that the manufacturer had overlooked the advantages of making the manual waterproof. It was rough that day, and we took several waves over the bow while pounding out of the inlet. My buddy and I fished for several hours, then decided to head back.

"Look in my bag up front and hand me those GPS instructions," I said. "I need to refresh my memory."

My companion retrieved the sodden manual. "I'll bet this lump once had pages," he observed.

"That's OK," I sighed. "We'll head for the Cape Lookout Lighthouse just yonder until we reach the channel markers, then follow them to the dock. I am just barely smart enough to do that."

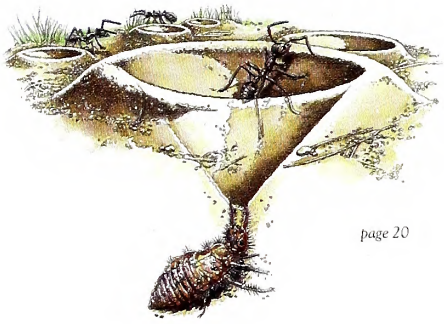
Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

June 2003 *Volume 67, Number 6*

page 2



page 20

Features

2 **Sandy Sanctuary** *written by Ida Phillips Lynch*
Now safe from development, Bird Island touches everyone willing to embrace its Kindred Spirit.

8 **The Late Shift** *written by Gerald Almy*
Nighttime can be the best time for anglers tired of hot weather and crowded waters.

12 **Millpond Magic** *written by John Manuel*
No longer needed for grinding or sawing, millponds still serve a vital role for both anglers and wildlife.

18 **The Old Gathering Place** *written by Jim Simons*
Destroyed by Hurricane Floyd, Tulls Millpond would not be forsaken by its owners or the surrounding community.

20 **Doodlebug Days** *written by David S. Lee*
illustrated by Jim Brown
Its reputation for idleness is exaggerated. The doodlebug, or ant lion, is actually a patient, skillful hunter-trapper.

24 **Go Wild** *written by Jim Borawa*
photographed by Jody Duggins
Fisheries biologists reveal details about North Carolina's varied wild-trout streams.

page 8

Departments

Our Natural Heritage *by Jim Dean* ..... inside cover
N.C. WILD Notebook *by Julie Dunlap* 28
Back Porch *by Greg Jenkins* 32
N.C. WILD Store 37

Cover *A wild brown trout lurks beneath the surface. Photograph by Jody Duggins.*

page 28

N.C. DOCUMENTS CLEARINGHOUSE

JUN 0 9 2003

STATE LIBRARY OF NORTH CAROLINA RALEIGH

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $7.50, three years $20, lifetime $100. All foreign subscriptions are $23.50 per year. For subscriptions from foreign countries, payment only by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377.

Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission. *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376. **Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.**

Sandy *Sanctuary*

WRITTEN BY
IDA PHILLIPS LYNCH

In the course of a lifetime, we are unable to witness those geological events that unfold over the eons. But on dynamic barrier islands, a person can readily witness dramatic transformations of the landscape, from the birth of a salt marsh to the migration of an inlet. Sunset Beach in Brunswick County is subject to many of the changes typical of barrier islands, both natural and artificial, but it stands alone in some ways. While erosion gnaws away at many of North Carolina's barrier islands, south-facing Sunset is accreting, thanks to a steady diet of sand provided by Tubbs Inlet. Unlike much of the North Carolina coast, Sunset lacks high-rise buildings and rampant commercial development, adding to the beach's laid-back, family-friendly atmosphere. The island's iconic one-lane pontoon bridge, beloved by many, is threatened by a proposal to replace it with a standard-issue, high-rise bridge.

And then there's neighboring Bird Island, which is sandwiched between Sunset and the Little River in South Carolina. Bird Island is the southernmost island in North Carolina; its western tip lies in South Carolina. Along with Masonboro Island and the Lea/Hutaff Island Complex in New Hanover County, Bird is among the only undeveloped barrier islands remaining in southeastern North Carolina. For many Sunset Beach residents and visitors, this untrammeled islet seems somehow immune from "progress."

When Bird Island's owners announced plans to develop the island in the early 1990s, a band of local conservationists launched a campaign to save the island. The ensuing struggle between the landowners and the impassioned preservationists landed the island in newspapers around the country. After 10 years of legal wrangling and prolonged negotiations, all's well that ends well. The state purchased Bird Island in 2002 as an addition to the N.C. Coastal Reserve System, the landowners were compensated for their property, and the island remains untouched for the public to enjoy. One question still lingers from this protracted struggle: Why does this unassuming strip of sand spark such loyalty in people?

Now safe from development, Bird Island touches everyone willing to embrace its Kindred Spirit.

BIRD ISLAND ADVOCATE FRANK NESMITH CHECKS THE MAILBOX IN WHICH VISITORS LEAVE MESSAGES TO KINDRED SPIRIT, THANKING THE ISLAND FOR THE ADVENTURE, SOLITUDE AND BLISS IT OFFERS.

JODY TIGGINS

JODY DUGGINS

SCOTT TAYLOR

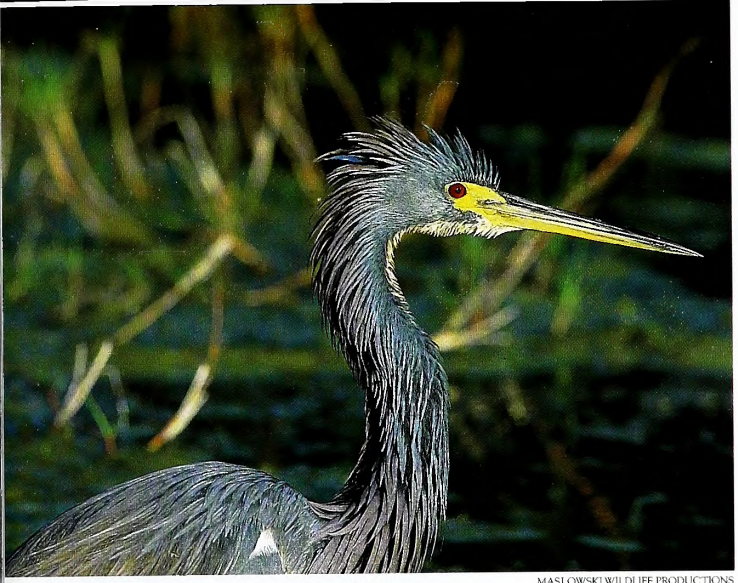
Visitors walk from Sunset Beach to Bird Island, where they can find pleasant isolation among the low dunes. As its name indicates, the island is a refuge for many species of shorebirds, including visiting flocks of piping plovers.

From the early 18th century until recently, mercurial Mad Inlet separated Bird Island from the western end of Sunset Beach. Visiting Bird on foot required a healthy respect for the unwavering laws of the changing tides. When I was a kid vacationing at Sunset 30-odd years ago, the elders in our clan gravely cautioned us reckless youngsters that if we tarried on the island, the rising tide would create a 200-foot-wide creek to be crossed at great peril. Given the inlet's ominous name, I heeded these stern words without complaint and only ventured to the island with the grownups, who always took the time to consult the tide tables. But over time, Mad Inlet shrank, and in 1997 it closed altogether, transforming the journey from a perilous wade or swim into mere steps in the sand.

In July 2002, my sister Elizabeth and I made our annual pilgrimage to Bird Island. After we passed the last walkway on Sunset, the sunburned crowds thinned out to a few beachcombers. We walked along the grassland fringing the island, finding pale pink flowers hidden in the grass and deer tracks in the sand. On the open beach, we could see the entire length of the low, narrow island that spans slightly more than a mile in length and is less than a half-mile wide at its widest point. The high rises of Cherry Grove Beach in South Carolina wavered in the hazy distance, but on Bird Island, the rocky jetty on the western tip of the island was the most prominent blight on the landscape. Sanderlings skittered in and out of the waves, and insects droned from the thicket behind us.

Walking in the shade of the high dune line, we wandered around undulating swales where spiny yucca plants were submerged in the sand. The dunes shield a dense maritime thicket of wax myrtle, live oak and loblolly pine that covers much of the island's interior and shelters small mammals and migratory songbirds such as variegated painted buntings. Other rare birds—such as piping plovers and wood storks, and more common wading birds, including glossy ibis, snowy egrets and tricolor herons—rest and feed on the beach and in the extensive salt marsh behind the island.

As we circumnavigated the island, we walked along the shore of the Little River, where boats streamed steadily through the inlet. Standing amidst the towering dunes on the western



MASLOWSKI WILDLIFE PRODUCTIONS

MASLOWSKI WILDLIFE PRODUCTIONS

TRICOLOR HERONS (ABOVE) AND WOOD STORKS (RIGHT) MAKE THEIR HOMES AMONG THE MARSHES OF BIRD ISLAND; NESTING LOGGERHEAD TURTLES TAKE ADVANTAGE OF THE UNSPOILED BEACHES TO LAY THEIR EGGS.

end of the island, we watched swallows and dragonflies swoop and glide over the thicket. Retracing our path to Sunset, we spotted four loggerhead sea turtle nests marked by protective wire screens. In the 2002 nesting season, 15 loggerhead nests were found on Sunset Beach and Bird Island, but as many as 29 have been laid there in past years. Biologists recorded approximately 625 loggerhead nests throughout the state in 2002.

Bird Island offers an increasingly elusive hideaway for nesting sea turtles and other creatures. "All nesting beaches are important, and although we don't quite understand all the factors turtles use to select particular beaches, we do understand those things that keep them away, namely lots of development and its attendant problems of nighttime lighting and heavy beach use by people," said Matthew Godfrey, sea turtle biologist with the N.C. Wildlife Resources Commission. "So undeveloped islands usually have a higher density of nests."

This pristine strand stands in stark contrast to the nearby Grand Strand. "They're not making barrier islands anymore," said Camilla Herlevich, executive director of the N.C. Coastal Land Trust, an organization that acquires open space and natural areas. "The south-facing islands in Brunswick County are some of the prettiest beaches in the state. Although we can't undo the building that's already on our barrier islands, we should not build on undeveloped islands."

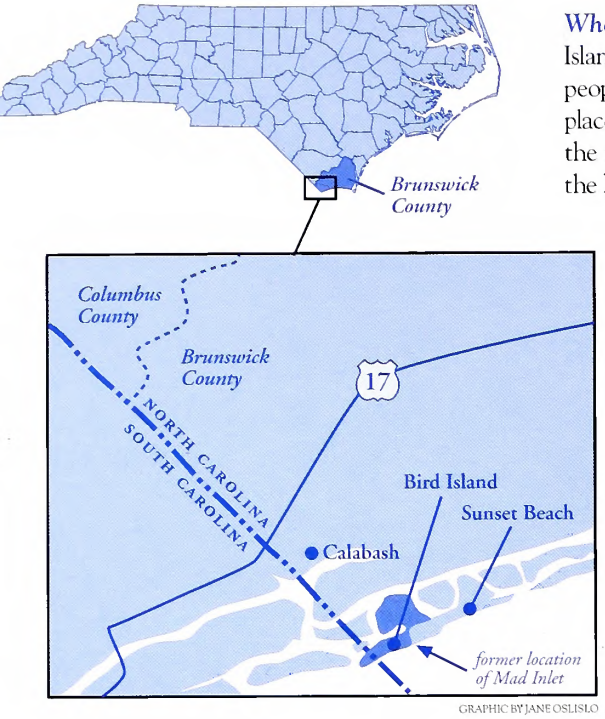
With its ample opportunities for walking, swimming and birding, this secluded beach mesmerizes Sunset Beach residents and vacationers from all over the country. "The Grand Canyon holds no more of a place in my heart than the marsh between Sunset Beach and Bird Island," said Frank Nesmith, a longtime Sunset Beach resident and Bird Island advocate. "It's just one of the prettiest places in the whole world. Before Mad Inlet closed up, there was a bit of adventure in a walk to Bird Island because you had to make sure you got off the island before the tide came in. So there was that element of danger, and the feeling that you were on a deserted island. And then there's a reward at the end of your walk, like the pot of gold. That's Kindred Spirit."

The Legend of Kindred Spirit. According to local lore, Kindred Spirit materialized more than 20 years ago, when someone erected a mailbox on a sand spit in Tubbs Inlet between Sunset Beach and Ocean Isle. Boaters recorded personal commentary in journals inside the mailbox. When the spit washed away, Nesmith placed another mailbox on Bird Island and stocked it with blank notebooks. Before long, Bird Island visitors began filling the pages with heartfelt missives.

"The name Kindred Spirit was originally intended to mean that the people who wrote in the journals were kindred spirits," recalls Nesmith. "But then everybody that wrote in the journals wrote to Kindred Spirit, as if they were writing to a person or a higher being."

SCOTT TAYLOR

On our walk, Elizabeth and I retrieved some of the journals from the black mailbox and sat on a makeshift driftwood bench while we leafed through the wrinkled, smudged notebooks, recording some of the more intriguing entries:



GRAPHIC BY JANE OSLISLO

7/7/02
I asked!
And I said Yes!
We're getting married!
—Josh and Amanda

Bird Island—one of Earth's top 10 places to reflect on life. Thank you Kindred Spirit. Thanks be to God.

What compels people to pour out their innermost thoughts in these tattered notebooks? "I tell people that the Kindred Spirit mailbox is the best psychiatrist couch in the state of North Carolina," Nesmith said. "You have this feeling of release and peace, and many people that write in the notebooks talk about a spiritual feeling or a closeness to God."

Minnie Hunt, another Sunset Beach resident and treasurer of the Bird Island Preservation Society (BIPS), agrees that many people find it therapeutic to write to Kindred Spirit. "The people that write in the notebooks just bare their souls because they know that no one knows who they are," Hunt said. "When you see the mailbox, you're invited and challenged to do it. There are a lot of things that people carry that they can't get rid of any other way."

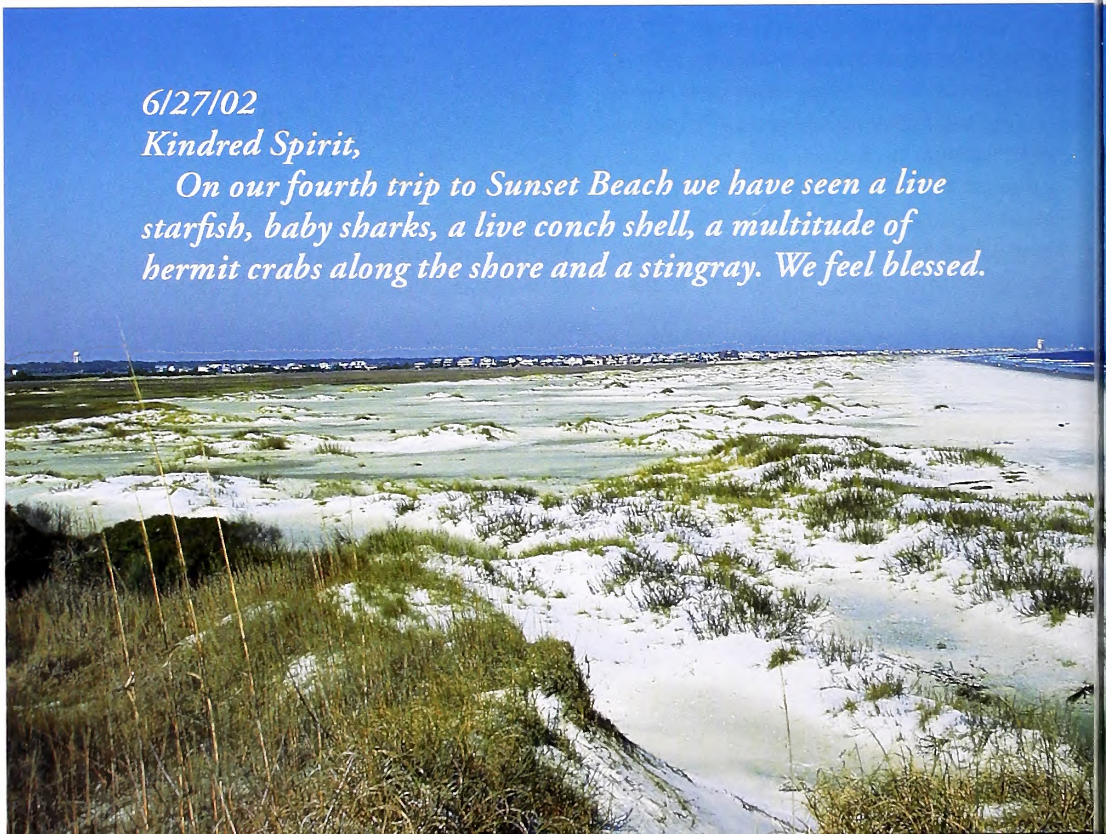
Who owns Bird Island? And therein lies Bird Island's mystique: Somewhere along the way, people began to view this island as a sacred place that should remain undeveloped. In fact, the island has been privately owned since the late 1770s. According to a history of Bird Island written by Dennis Daniels in 2002, Ralph Price purchased Bird Island in 1953 for $65,000. Price hoped to transform Bird Island into a haven for his family, and in 1965 he dredged a channel from Salt Boiler Creek extending down to Mad Inlet. By 1966 a route that included a 4,000-foot-long causeway and a 440-foot bridge had been constructed. A 1966 aerial photograph indicates that he had built two roads that spurred from the main route on the island. Price built a pier and installed power lines, underground phone lines, a septic tank and a well.

Price's progress was halted around 1970 when vandals torched the bridge leading to the island and reportedly scattered tacks in the road to deter fire trucks. All development on Bird Island stopped. The electrical poles and charred bridge pilings were abandoned to the salty air.

Price died in 1989 and left Bird Island to his widow, Jane. In February of 1992 the Price family announced plans to build a mile-long system of bridges and causeways crossing Mad Inlet to support access for a planned 15-lot subdivision on Bird Island, according to Lauren Kolodij, program manager with the N.C. Coastal Federation. Bird Island enthusiasts responded immediately.

"When the owners proposed getting a permit for bridges and developing Bird Island, that galvanized a group of local folks who decided to see what they could do to save the island," Herlevich recalled. "They sought the expertise of other non-profit environmental groups to help stop the development initiative."

Under the umbrella of the N.C. Coastal Federation, and with assistance from the N.C. Audubon Society and N.C. Coastal Land Trust, the Bird Island Preservation Society launched a campaign to raise awareness about the island. The public relations campaign was straightforward and effective: Let the island work its magic. Every day during the summer, Frank Nesmith led vacationers on walks to Bird Island, making sure the group stayed on the publicly owned beach below the high-tide line. Nesmith's enthusiasm and affection for Bird proved utterly contagious. "We'd have 150 people on some of those walks!" he recalls. "I'd talk about the nature of the island and the beauty of the place. We saw all kinds of things: bald eagles, fox prints and turtle tracks." Nesmith also introduced the groups to Kindred Spirit. "The Kindred Spirit mailbox was the real magic of this whole project," said Hunt. "Once people read those journals, they were hooked." Many trip participants pledged



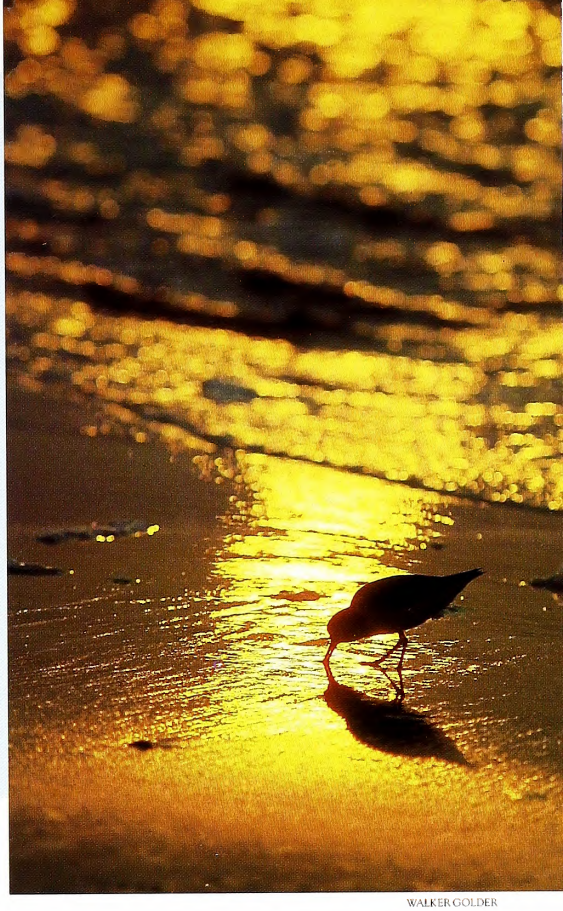
Where can I find more information?

For more information about visiting Bird Island Coastal Reserve, visit the N.C. National Estuarine Research Reserve Web site at www.ncnerr.org/.

What is the Bird Island Preservation Society?

BIPS is a nonprofit organization devoted to the ongoing stewardship of Bird Island. In February 2002, BIPS received the Governor's Conservation Achievement Award for Conservation Organization of the Year in honor of its 10-year effort to save Bird Island. The group has pledged to raise $250,000 to provide a stewardship endowment that will assist with the long-term management of Bird Island and help fund a summer naturalist position. This person will monitor the island and its nesting birds and turtles as well as conduct research and educational programs.

For more information or to make a tax-deductible contribution to the Bird Island Preservation Society Endowment Fund, contact BIPS at P.O. Box 7261, Shallotte, NC 28470, e-mail birdisland@nccoast.org or call the N.C. Coastal Federation at (252) 393-8185.



WALKER GOLDER

At sunrise, a sanderling enjoys the bounty and sanctuary of the island's shoreline.

their support to the society, donning Bird Island T-shirts and writing state officials about the need to protect the island.

Early on, the group pursued the purchase of the island as an alternative to development. Through a bill engineered by state Rep. David Redwine of Brunswick County, the Department of Environment and Natural Resources issued a report in June 1993 that noted: "Bird Island possesses biological, educational and recreational values of statewide significance. It is the last remaining undeveloped barrier island in Brunswick County, and its diverse natural communities provide habitat for a number of rare plant and animal species. Therefore, state acquisition of Bird Island is appropriate." Newspapers published editorials endorsing the preservation of Bird Island.

JODY DUGGINS

While development is visible just across the waterway, life on Bird Island is still unspoiled and idyllic.

Meanwhile, the Price family was wading through the complex process of applying for permits to build. The Bird Island Preservation Society vigilantly monitored the permitting process with help from the N.C. Coastal Federation and other groups. "After three and a half years of presenting legal pleas to state and federal officials," Kolodij said, "BIPS succeeded in having state permits for the bridge and causeway denied in the fall of 1995 by a declaratory ruling by the N.C. Coastal Resources Commission."

The same year, the state began talking to the Price family about purchasing the island. The family rejected an offer from the state in 1997, and the project languished until the summer of 2001, when the Price family agreed to the state's offer of $4.2 million.

Bird Island Coastal Reserve. The N.C. Division of Coastal Management is still developing its plan for the new Bird Island Coastal Reserve, but the public will see little change. "In general, our policy is to leave our sites open for passive recreational use, unless there is some kind of traditional use that's in conflict with protecting the natural area," said John Taggart, reserve coordinator for the division. "Bird Island is open to the public for walking, fishing, swimming, surfing and kayaking."

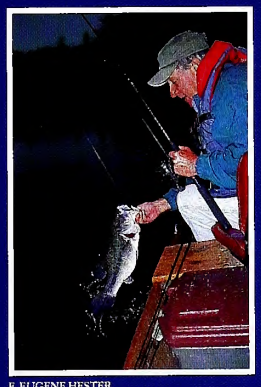
And Kindred Spirit? The mailbox stays. "It's the spirit of the island," said Nesmith. "I'd give the Kindred Spirit mailbox credit for saving the island. Twenty years ago, people wrote in that mailbox, 'Let's keep the island the way it is and not develop it,' and that really gave us the incentive to save it."

Looking through some old personal journals, I found an entry I wrote after a trip to Sunset. Could this be the answer to the lingering question?

> *"Spent a week at Sunset Beach with the family. We walked to Bird Island about every day. After several windy, overcast days, the wind finally died down. That afternoon the water was like glass, and the waves were perfect—nice series of rollers. Elizabeth and I rode wave after wave, as the current slowly pulled us down the beach. I dove under a wave and popped up on the surface as foam crackled and dissipated in its wake. I looked back at the shore and saw that we had drifted all the way to Bird Island. It was deserted. A flock of shorebirds skimmed over the water right in front of me. I looked over at Elizabeth and she turned to look at me. We didn't say a word. We were just waiting for the next wave."*

Entry to Kindred Spirit:
7/7/02
The happy news is that Bird Island will always be. Pace e Bene (Peace and All Good). ⊠

the Late Shift



F. EUGENE HESTER

written by Gerald Almy

Nighttime can be the best time for anglers tired of hot weather and crowded waters.

When I asked my friend how he'd gotten permission to fish the snazzy, beautifully landscaped lake with the fountain and floodlights, he seemed a bit evasive in his answer. So, I wasn't too surprised to see him drop his rod and dive behind the nearest bush when the property's security vehicle made the first of its hourly patrols. I followed his lead, then quickly snatched my rod back up when the vehicle left—often to find a fish struggling on the end of the line. It was clear "permission" wasn't quite the right word to describe how we were fishing there.

In between the distraction of diving for the bushes once an hour, I couldn't believe how many bass, mixed with fat bluegills, we were catching from this impeccably landscaped, decidedly private lake. We were teenagers just learning to fish and had never enjoyed bass action this good during daylight hours. We must have caught and released 50 largemouths before we made our escape at midnight.

I felt guilty when it dawned on me that we were trespassing—a little scared, too. But the fishing was just too good to leave until finally we grew weary of the easy sport, and figured our parents would be expecting us home. As a grownup, I don't approve of law-breaking or trespassing, but I guess in retrospect, a couple of motley-looking teenagers could have been doing a lot worse. In my defense, I did not know beforehand that we didn't have permission. I just knew we were going fishing after dark—something I'd never done before. And I have to credit the illicit outing with making me a diehard night angler.

That trip illustrated one of the main attractions of night fishing that draws so many people into the sport, which has kept me coming back for more than 30 years. Bass, in many waters, simply bite better after the sun goes down. Not only that, some of the biggest fish in a lake become more aggressive at night. You'll also have less competition for prime fishing spots than during daylight hours and no interference from swimmers, pleasure boaters and water skiers.

There are other benefits to night fishing as well. You don't get sunburned or risk cataracts and UV damage to the skin. It's cooler and more pleasant than sizzling under the hot midday sun. It's also peaceful and quiet, offering a chance to unwind from the stresses of modern life. Winds often lay out in the evening, making for easier boat control. And night fishing often means shallow-water fishing, which many of us find particularly appealing.

The final allure of night fishing, though, is that it simply provides a totally unique experience to enrich one's life. It is so different from daytime angling that it almost seems like a whole different sport. Vision is put on the back burner, with perhaps vague, shadowy images and gray outlines showing up, but often just pure blackness. That puts the senses of sound and touch in the forefront, where they rarely are during times when we can see. You'll feel your jig crawling over each rock or limb of brush like never before when you're fishing at night. The same goes for a wobbling or shimmying crankbait. The vibrations seem to pulse right through your hands into your body. Both the *tap tap* of a bass grabbing a plastic worm and the hook set seem more intense than they ever do in daylight.

Largemouth bass can often be caught at night using lures that cause a commotion such as a topwater plug or spinnerbait (facing page).

SCC CLAY

F. EUGENE HESTER

Sometimes a slow, steady retrieve will entice bites at night, while other times bass are aroused by a fast retrieve that creates a wake near the surface.

The sense of sound is in the forefront, too, with the hoot of an owl, the mellifluous song of a whippoorwill, the chirp of crickets and the *ribbet* and *barrumph* of frogs creating a symphony of sound. But the rhythmic gurgle of a wobbling Jitterbug is a song in itself, punctuated with a cymbal crash when an outsized bass slams the gurgling crankbait.

To get the most out of night fishing for bass in North Carolina, though, preparation is vital. You need to choose the right waters, select the most productive lures, pick the best targets to cast to and use the right retrieves. Since night fishing is inherently more dangerous than angling in the daylight, it's also important to keep safety first and foremost in mind.

If venturing out in a boat, wear your life vest at all times. Our sense of balance isn't as good at night, and it's easy to become disoriented if you fall overboard in the darkness. Motor more slowly than you would in daylight and keep your running lights on as required by law. Pick lakes with few obstructions or floating debris. Use a high-powered spotlight to check for dangers, keep your bearing and alert other boats if they come near you. Try to launch the boat as close to the area you plan to fish as possible, so you'll have to do little running at high speed.

You should also choose waters you are familiar with when planning a fishing trip at night. You need to know where basic structures are such as points, humps, islands, river channels and bridges. Night is no time to be learning these things. Many of the areas you fish during the day will also be productive at night, so the more you know about the lake the better. A map and sonar are vital on large waters, but on-the-water experience in daylight can't be replaced.

Check with marinas, tackle shops, enforcement officers and fisheries biologists as to what waters are particularly rewarding at night. Almost any lake with a decent black bass population can produce good night fishing, but some can yield extraordinary action.

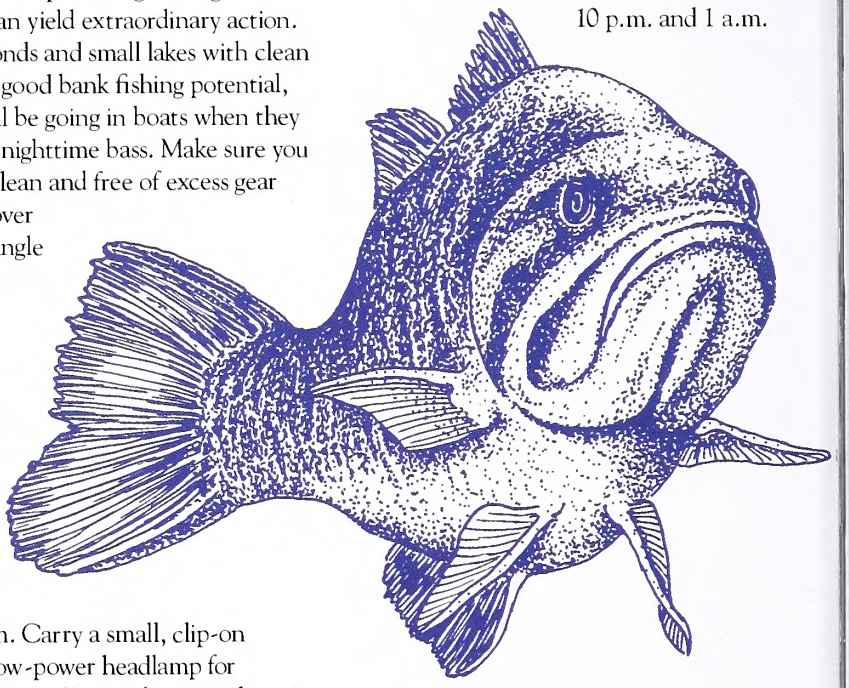
Although ponds and small lakes with clean shorelines offer good bank fishing potential, most people will be going in boats when they venture out for nighttime bass. Make sure you have the boat clean and free of excess gear you could trip over or that could tangle in your line. If anything can possibly get in the way, it will at night. Rig up two or three outfits that you're comfortable and familiar with and stow all but one of them. Carry a small, clip-on flashlight or a low-power headlamp for changing baits. Keep lures in boxes with the lids closed and latched. An open lure box at night is an invitation for disaster.

Weather does not seem to influence bass feeding much at night, but there's no question it's easier and more pleasant to fish after dark when winds are light. Those are also better conditions for fishing surface lures. Boat control and positioning are easier, and you're less likely to get blown off course or into the bank as you fish.

Opinions vary on the influence of the moon. I've had good luck on all moon phases over the years at different times. Unless you're experienced at night fishing, though, a bit of moon makes it a little easier because you have some vision that way. If the moon is bright, concentrate on the shadows it casts. Bass will wait in ambush on the dark sides of bridge pilings, docks and protruding logs.

Plan to be at the lake at least an hour before sunset. This lets you prepare your gear and tackle, launch the boat and arrive at the first fishing spot before dark. You'll also be able to enjoy the twilight feeding binge that bass often go on just before nightfall. Being on the water as the sun sets also lets your eyes dilate slowly as daylight fades, so you can see as well as possible.

Don't be disappointed if fish fail to bite right after the sun goes down. Typically there's a feeding flurry at sunset, then a short slow period. After about an hour, another flurry of action often takes place. It may continue throughout the night, or fishing may slow down and grow spotty for a few hours, then pick up again between 10 p.m. and 1 a.m.



A lull may occur then, and if you have to go to work the next day, this might be a good time to call it quits and head for the dock. If you want to hang in there, though, some fish will feed right through the night, with more action usually occurring just before and as the new day begins.

Spots to fish at night include many that you would fish during the day. Points are always good, particularly if there's some brush or a fallen log on them or if they lie near a river channel dropoff. Humps, submerged islands, bridge abutments, flooded brush and timber, riprap near roads, rock ledges and the edges of weedbeds are also hot spots for night fishing. Docks can be well worth fishing—both lit and unlit ones. If they have lights, fish the dark side of the pilings and structure, where bass will wait

for unsuspecting forage fish to fin by. Spots that you might not fish during the day are also worth trying, such as launch ramps and swimming beaches.

Artificials useful for night fishing range from bottom-bouncing plastic worms and jigs to surface wobblers. In general, it's best to use larger models, since they are easier for bass to locate, and fish seem emboldened by the night to attack bigger prey than they might in the harsh light of day. Lures that displace lots of water, make loud vibrations, rattle or gurgle are also good—anything that will alert bass to its presence by means other than vision.

For sheer fun, nothing can beat topwater. Unless it's windy, I'll almost always turn to a popper, stickbait or wobbler such as the Jitterbug to see if bass are willing to strike on top.

Artificials useful for night fishing range from bottom-bouncing plastic worms and jigs to surface wobblers.

The one-fourth-ounce version of the famous Arbogast wobbler works well on ponds or for smallmouths. The three-eighths- or five-eighths-ounce models are good all-around choices. But don't overlook the muskie-sized 1 1/4-ounce version if bass 5 pounds or heavier are present. One trick is to use a large crankbait with treble hooks on the side and attach them on the top of the lure with a small rubber band. This reduces hang-ups in weeds and seems to result in a better hookup ratio.

Black is the best color, as it is with many night lures. It silhouettes well against the light sky. Work surface wobblers with a slow, steady retrieve to get that rhythmic gurgling sound. That makes it easy for a fish to judge its progress and key in on it for the strike. When you set the hook, pull the rod tip sideways, rather than straight up. That way if the fish misses the bait, you won't send it flying back in the night towards yourself or your partner.

If the lake surface is choppy or surface lures just don't seem to be producing, try a spinnerbait. A three-eighths to three-quarter-ounce model with one or two wide Colorado blades is a good choice, since it creates a loud, thumping vibration that fish can easily detect. Try them both alone and dressed with a plastic trailer or pork rind. A slow, steady retrieve is often best, but also use a faster presentation that creates a V-wake just under the surface. If neither of these produces, "yo-yo" the bait by pulling it up several feet and letting it drop back down.

A shimmying crankbait is an excellent choice for night bass because of the vibrations it gives off and the large amount of water it displaces. Use models that dive the appropriate depth for the water you're fishing, and lean towards ones with rattles, so the bass can locate them easily. Work with a slow to moderate retrieve.

Vibrators or lipless crankbaits such as the Rat-L-Trap and Spot are also good after-dark lures.

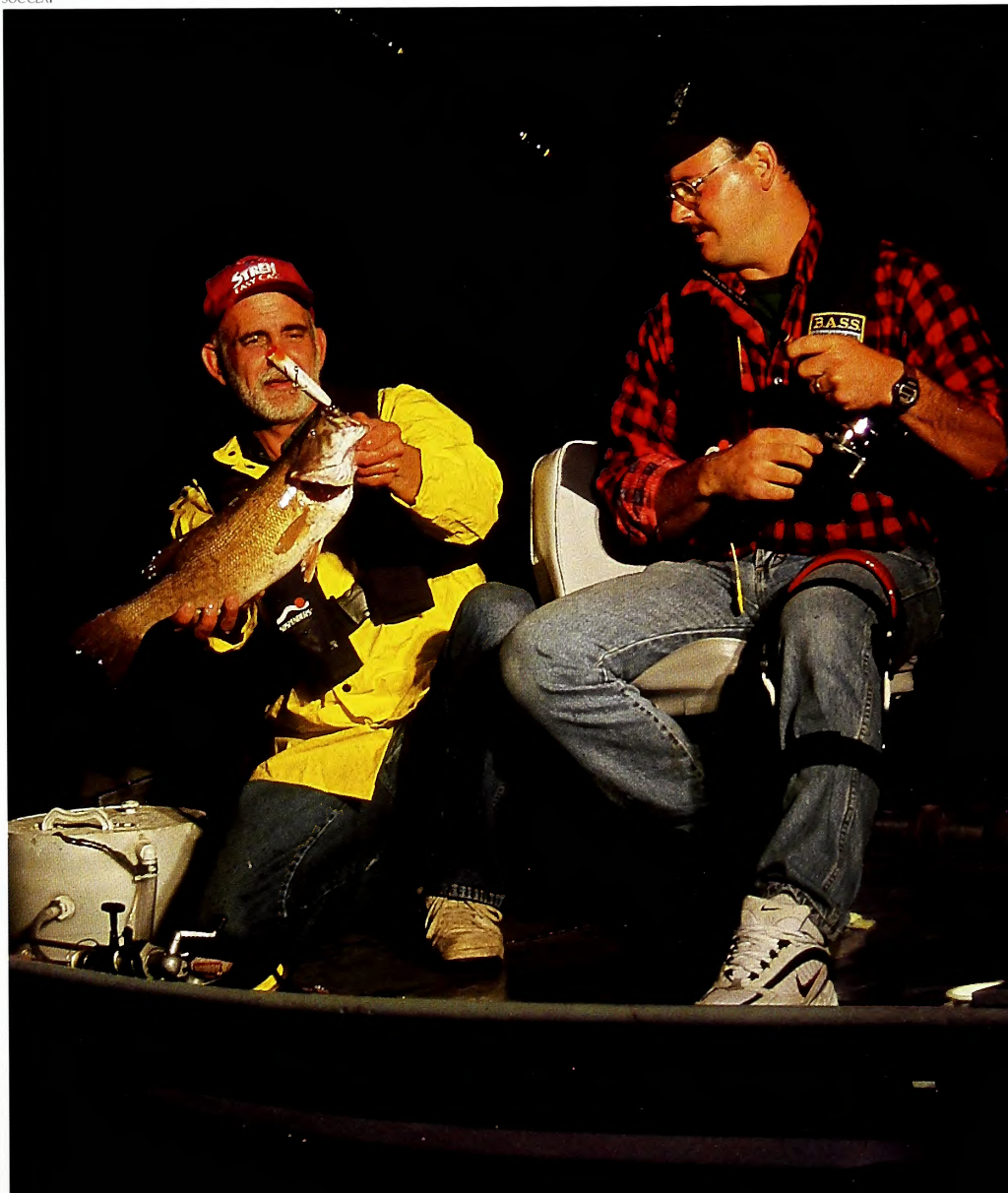
These typically sink one foot per second, so you can count down to the depth where fish are before beginning the retrieve. Reel steadily, but if that doesn't yield strikes, try pausing occasionally partway back to let the lure fall deeper like a wounded shad.

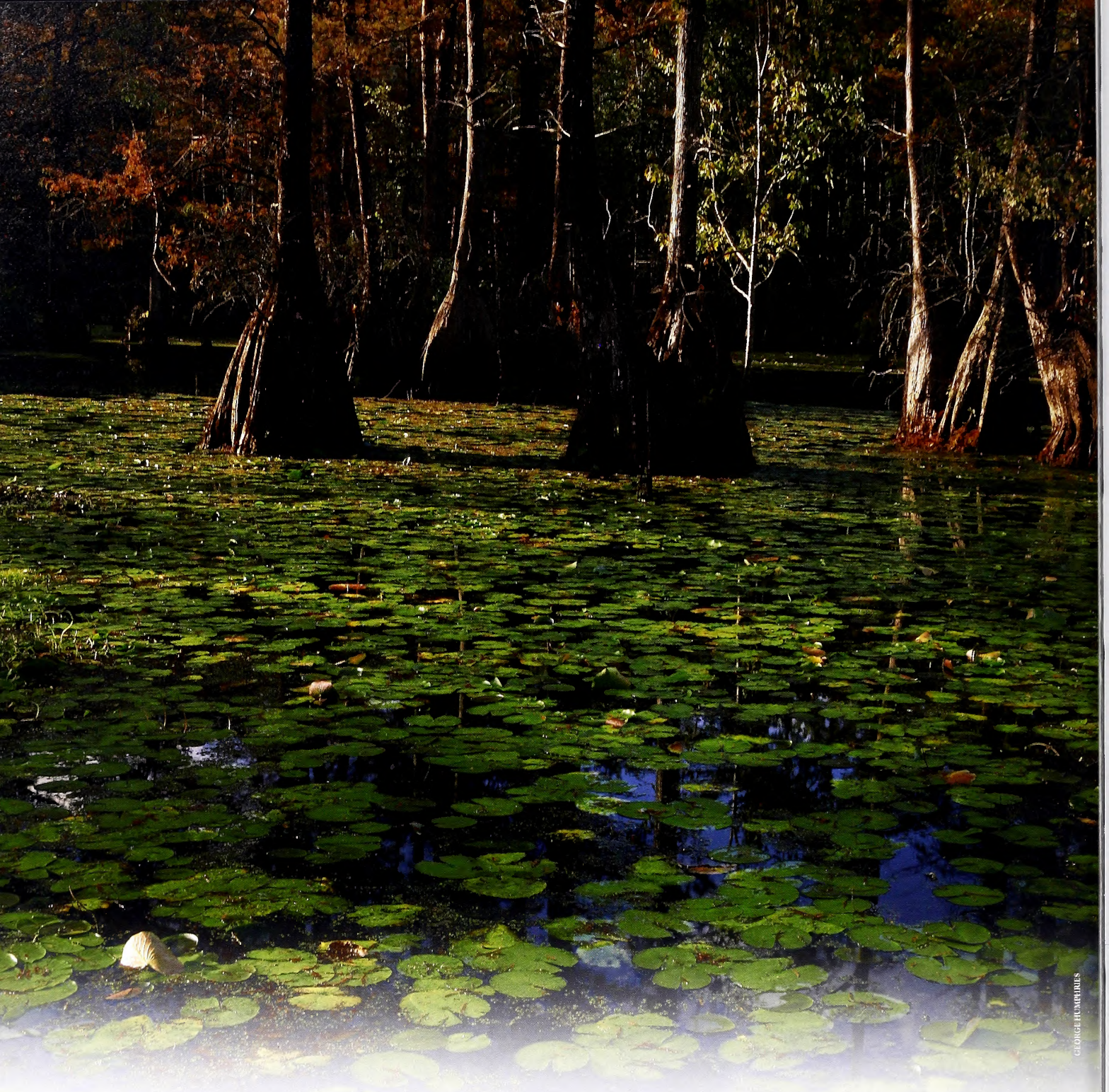
Plastic worms might seem unlikely choices for night fishing, but they can be deadly as they slither through cover. For extra sound, you can slip a rattling insert into the worm.

Bass are emboldened by the dark, so go with big worms—6 to 8 inches in black, blue or purple. Some anglers stick with Texas rigging while others feel they miss fewer strikes with a multiple exposed-hook rig. Fish the latter Carolina-style, with a weight 18 to 36 inches up the line.

A final lure that should be in every night fisherman's box is the jig, preferably tipped with a pork frog, crayfish or eel. Use a rubber-skirted or bucktail-dressed leadhead in black, brown or purple, weighing one-fourth to one-half ounce. Try a slow, crawling retrieve, or hop it across the bottom. And hold on tight when a fish takes—the biggest bass of your life could be on the line raring to fight. The brutes come out at night. ⊠

SOC CLAY





GEORGE HUMPHRIES

Millpond Magic

WRITTEN BY JOHN MANUEL

No longer needed for grinding or sawing, millponds still serve a vital role for both anglers and wildlife.

JIM DEAN

I carry a vision of paradise. Cypress trees draped in Spanish moss rise above still water. A wood duck paddles among the trunks. A kingfisher dapples the surface. Beside a weather-beaten building, a white sheet of water hisses over a small dam. Paradise is a millpond.

I've seen no more than a dozen of the hundreds of millponds that dot the Piedmont and Coastal Plain of North Carolina. But they are enough to convince me that these are magical places, endowed with a unique combination of natural and manmade beauty. For three centuries, millponds have been an integral part of the North Carolina landscape. They played an important role in our economic development, providing power to run sawmills, gristmills and cotton gins. They were community gathering places. And without intending to, they played an important ecological function that continues to this day.

Records indicate that North Carolinians began constructing water mills in the early 1700s, and probably before then. The General Assembly in 1715 delegated to the district courts the authority to grant franchises in their respective districts for the construction of water mills. Settlers found the state blessed with an abundance of streams that were narrow enough to dam and had sufficient rates of fall to turn a heavy water wheel. Dams were erected to impound enough water to keep the mills running through the dry summers. In effect, the millpond served as a giant fuel tank.

Because of the steepness of the terrain, millponds of any size were infeasible to construct in the mountains. Conversely, the terrain at the eastern edge of the Coastal Plain was too flat to power watermills. But everywhere in between, including sites within a few miles of the Albemarle and Pamlico sounds, mills and millponds blossomed.

Millponds became natural gathering spots for local residents. Sawing a load of wood or grinding bushels of corn could take many hours. During that time, customers would sit around and talk, or fish in the millpond. "My granddaddy used to keep a skiff down at Bennett's Millpond and would go out fishing when the corn was being ground," says Bob Harrell, executive director of the Albemarle Learning Center in Edenton. "To hear him tell it, he pulled some mighty big fish out of there in his day."

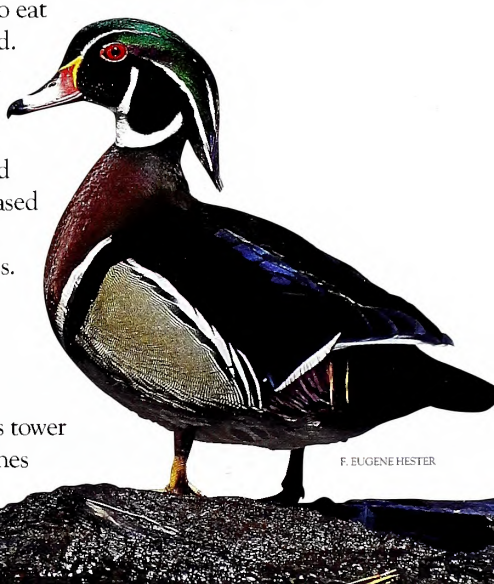
Water mills thrived well into the 20th century (Bennett's Mill operated into the 1940s), though gasoline and electricity often supplemented hydropower. By the mid-20th century, however, small mills were no longer competitive. Most of the mill buildings were abandoned and have subsequently disappeared—collapsed, torn down or washed out by floods. But, for the most part, the millponds have survived.

Jurassic Park East

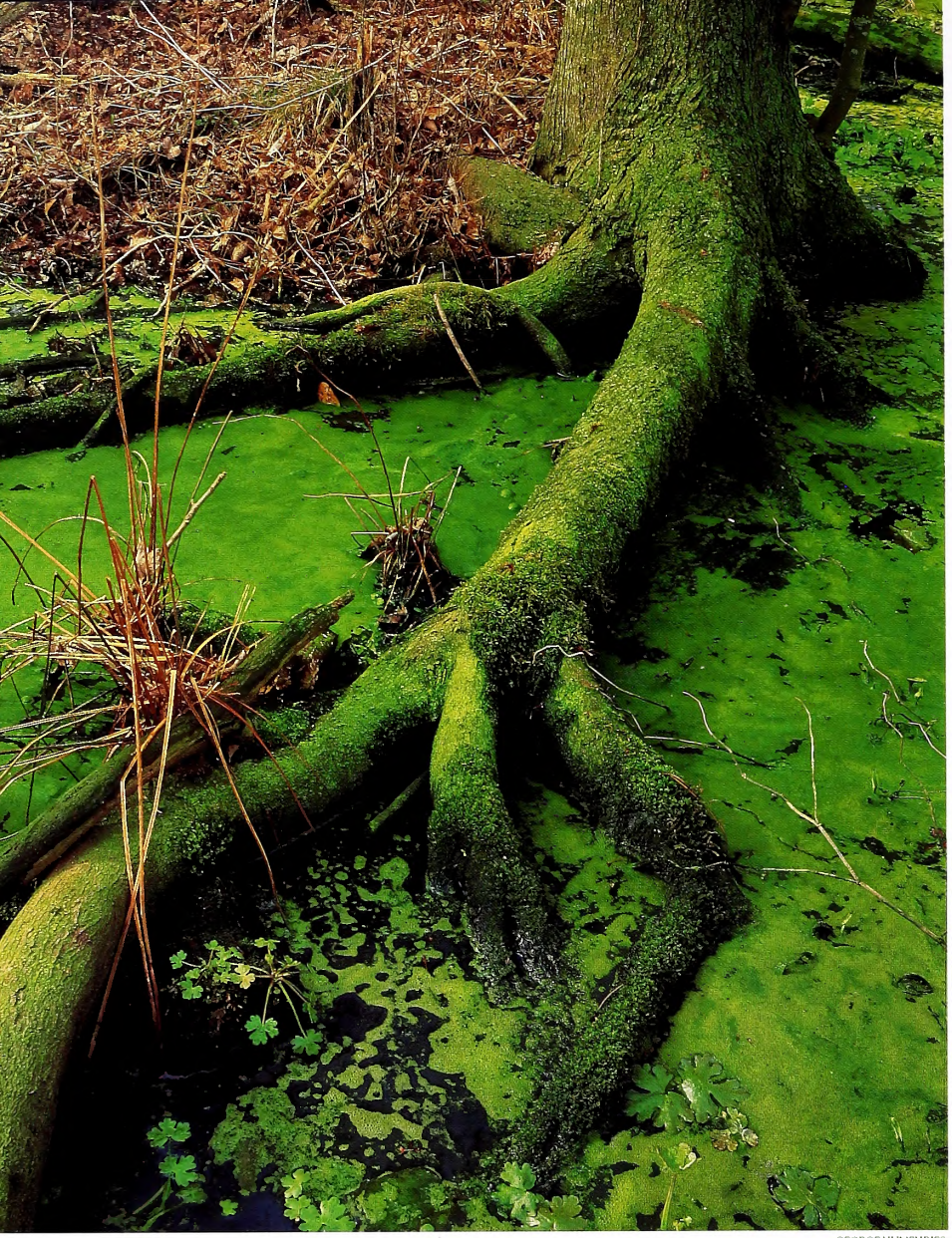
Before we even have the canoe off the car, Dave has hooked his first bass. Dave lives to fish, and asking him to wait until we get the boat in the water before he starts casting is like asking someone not to eat the hush puppies until the barbecue is served. I'm no better when it comes to snakes. I saw a beautiful yellow-bellied water snake the instant I stepped out of the car and I've been chasing him around the ruins of the old mill building ever since. When Dave has released his bass and my snake has disappeared into the brambles, we finally get down to business. We put the fishing rods and camera gear in the canoe and push off the dock into Bennett's Millpond.

Located in Chowan County, Bennett's Millpond is a world unto itself. Cypress trees tower above tea-colored water carpeted with patches

A MILLPOND *is perfect for wood ducks and other aquatic species. Anglers like them too, as evidenced by the boat shed (above).*



F. EUGENE HESTER



GEORGE HUMPHRIES

F. EUGENE HESTER

of electric-green duckweed. Spaced out across the width and breadth of the mile-long pond, the trees give the impression of an African savannah. Dave and I have not traveled a hundred yards before we see an osprey take flight. The big bird makes a circle around the pond, then comes back to the tree and hovers overhead.

"She's got a nest," Dave says, pointing to the cluster of sticks protruding above the anvil-headed crown.

We give the tree a wide berth and head out into the middle of the pond, casting rubber worms amidst the openings in the duckweed. Dave's line begins to move, and in one of those breathtaking moments that anglers relive a thousand times, a monster bass rises out of the water, shakes his head and tosses the worm back in Dave's face.

"Oh, my goodness! Did you see? I can't believe. . . !"

I can only offer Dave my condolences and reassure him that there are other fish out there waiting.

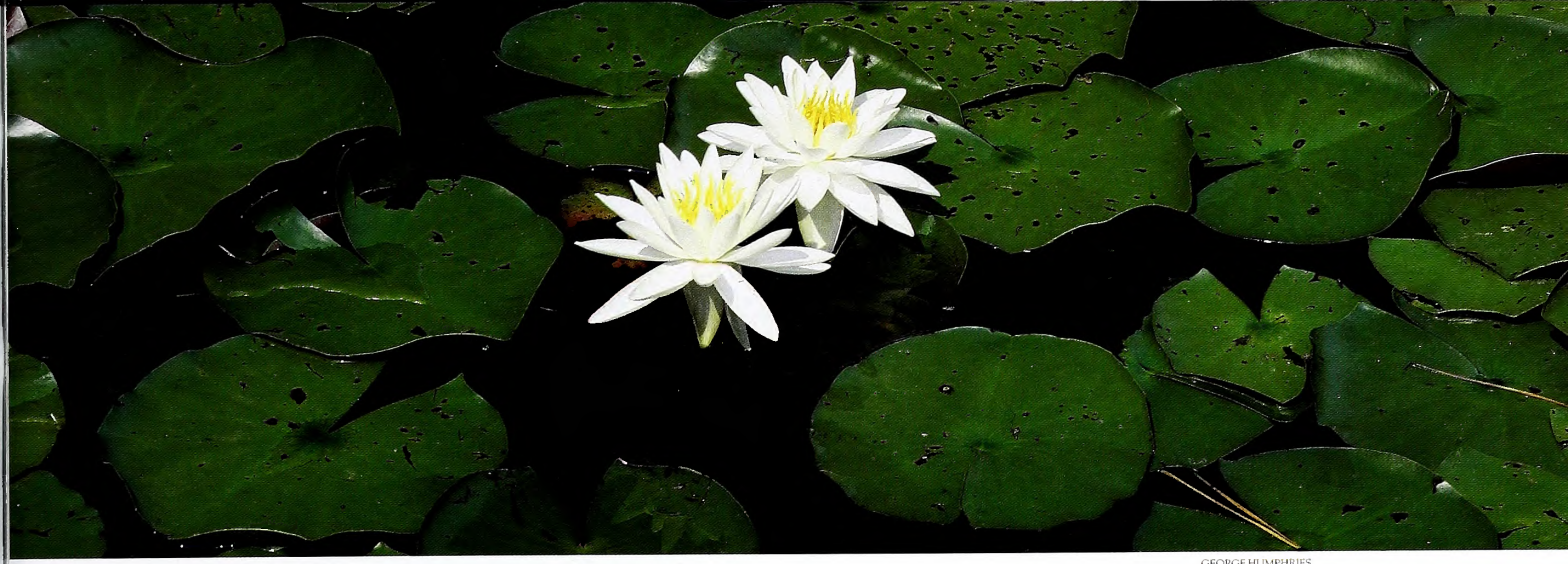
As we cruise among the cypress trees, water moccasins slither off the buttressed trunks. A heron takes wing; its guttural cries add to the primordial atmosphere. Along the shore, I spot what looks at first to be a beaver. But its head is too big and the muzzle too white. It's a nutria, the world's largest rodent, newly migrated to North Carolina by way of South America.

Dave shakes his head. "This place is one dinosaur shy of Jurassic Park."

The allusion to age is not accidental. Many of the millponds in the eastern part of the state are more than 200 years old. That's nothing in geologic time, but it is more than enough years for these ponds to develop their own highly varied ecosystems. Take Merchants Millpond in Gates County. A recent survey of the millpond and surrounding woodlands by the state's Natural Heritage Program identified 36 species of mammals, 206 species of birds, 68 species of reptiles and amphibians, 28 species of fish and 352 species of vascular plants. Among the latter are several rare species of aquatic plants, including featherfoil, water crowfoot and a pondweed known as conferva.

"Millponds are huge oases for wildlife," says Cecil Frost, plant ecologist with the N.C. Department of Agriculture and Consumer Services. "They hold water even during droughts. They have a tremendous gradient of habitats with respect to light and water depth. Especially at the upper ends of millponds, you get shallow water with a lot of sunlight. That's not something you get in nature. Those habitats don't stay open for long because trees grow over them."

While serving as superintendent, Frost observed a number of animal species at Merchants Millpond that were uncommon elsewhere. "Chain pickerel and redfin pickerel seemed uniquely adapted to the millpond," he says. "Musk turtles, called stinkpots, were all over the bushes. Birds, including a whole suite of warblers, liked to nest in the trees out in the millpond. The northern parula, in particular, loved to nest in the Spanish moss."



GEORGE HUMPHRIES

F. EUGENE HESTER

WHEN BEAVERS *were nearly extirpated from the state in the late 1800s, millponds provided a needed sanctuary for the remnants of the once vast population. The sprawling root system of a tupelo gum (facing page) gives the tree support in an unstable environment, while water lilies (top) are anchored to the pond's bottom by long stalks.*

Millponds are also prized habitat for waterfowl, according to Dennis Luszcz, migratory bird coordinator for the N.C. Wildlife Resources Commission. "We see a lot of widgeons, gadwalls, wood ducks and ring-necked ducks on the millponds," Luszcz says. "They feed on the submerged vegetation, which you don't find a lot of in the rivers and streams and which people try to keep out of their farm ponds. The millponds are larger than most beaver ponds and often fairly isolated. During periods of high winds on the coast, you'll also see scaup, buffleheads and black ducks using the millponds as shelter."

Michael Schafale, zoologist with the N.C. Natural Heritage Program, has inventoried more than a dozen millponds across the state. "We regard millponds as ecologically significant," Schafale says. "They are of artificial origin, but we treat them as natural communities. When beavers were driven out of the state, millponds were the only places many species could survive."

Beavers were completely trapped out of North Carolina in 1897 and did not return until the late 1950s. During that half-century, millponds provided a protective environment for plant and animal species not adapted to the swift currents and shady edges of streams and rivers. Though beavers have returned in great numbers, millponds continue to provide a stable habitat, while beaver ponds come and go.

Millponds not only provide valuable habitat, they also improve water quality in the watersheds where they are found. A 1989 study of Merchants Millpond showed that it acts as a settling basin for nutrients and sediments from upstream agricultural operations. Other studies have shown that millponds reduce the severity and duration of downstream flooding and erosion by reducing peak runoff during times of heavy rainfall.

The settling function of millponds can mean that the water quality in the ponds themselves is sometimes less than pristine. Millponds can experience sedimentation, turbidity, unbalanced populations of rough fish (carp, etc.) and excessive algae blooms. Dave and I find that out as we plow through increasingly thick mats of duckweed at the upper end of Bennett's Millpond. Finally, we give up and head back to the dock, content to have seen more wildlife in one hour than either of us has seen on miles of river trips.

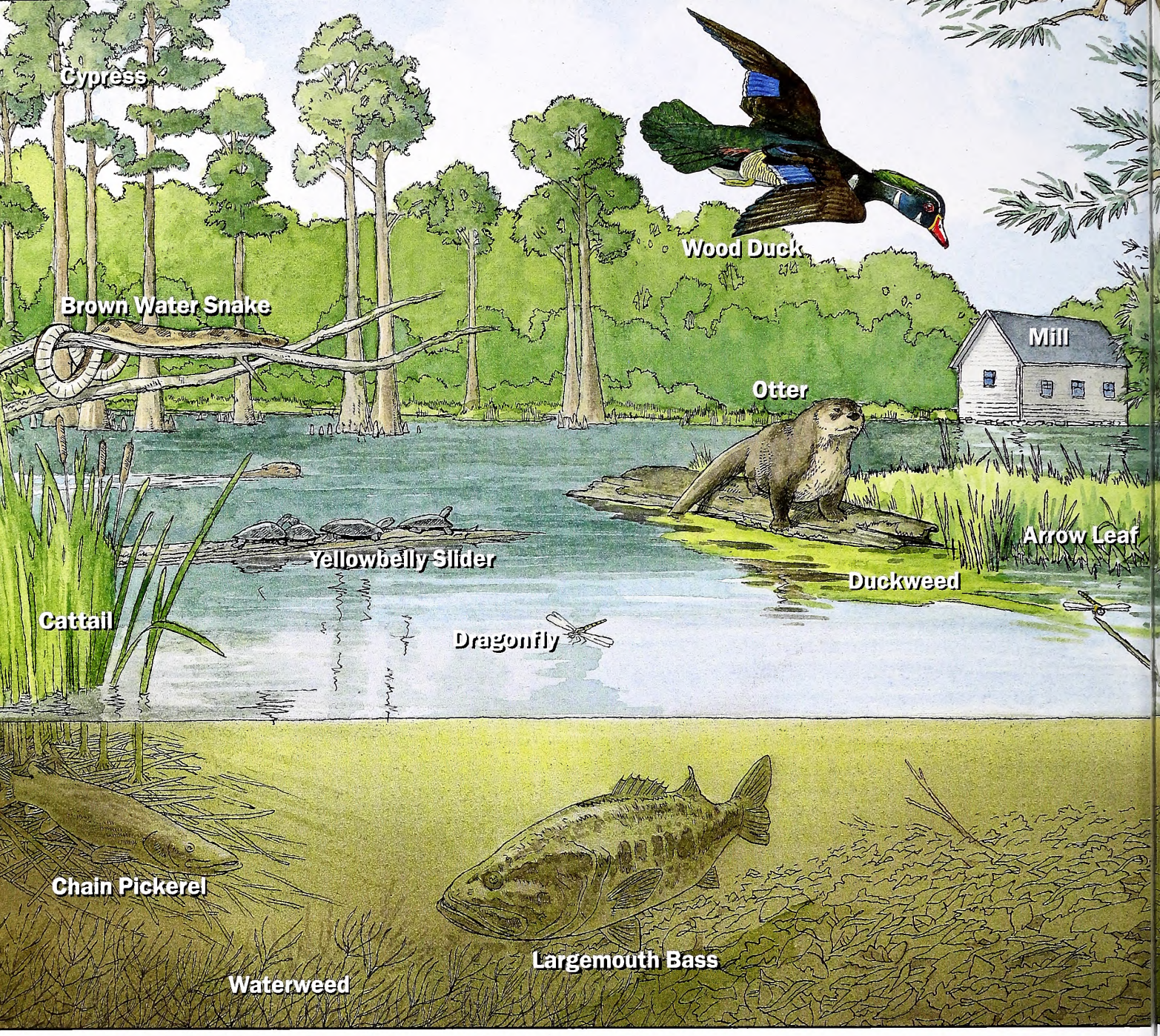
An Endangered Species

Although several hundred millponds have survived to the present day, their future is by no means guaranteed. At least nine millpond dams were breached during hurricanes Fran and Floyd; the water drained out, and fish were swept downstream. Repairing a large dam is an expensive proposition, and more than a few landowners decided not to rebuild.

Other millponds are threatened with development. As urban areas expand, millponds become natural magnets for housing developments. Many millpond owners are elderly, and the estate taxes owed upon their deaths may prompt the surviving family members to sell off part or all of the property. The plight of the millponds has attracted the attention of several local, state and national organizations, chief among the latter being The Conservation Fund.

A national nonprofit organization with a state office in Chapel Hill, The Conservation Fund seeks to preserve the nation's outdoor heritage through the formation of public/private partnerships. The fund has a particular interest in projects that will yield an economic benefit while protecting natural resources. In the wake of Hurricane Floyd, the organization teamed up with the N. C. Rural Economic Development Center to identify opportunities to "build back better," that is, restore damaged infrastructure in a way that would lead to a more sustainable economic future. Millponds were noted as valuable community resources that had been ravaged by the storm. Securing a grant from the center, The Conservation Fund commissioned an inventory and preservation prioritization analysis of millponds in eastern North Carolina.

Conducted by two students from Duke University, the study analyzed 27 millponds with respect to ecological condition, community benefit and vulnerability to development. Ten millponds were selected for prioritization. Based on these standings, The Conservation Fund has set out to secure funding for the preservation of these millponds. The top



ranked among these, and the first to be restored successfully, is Tulls Millpond.

Tulls Millpond is a 200-acre gem located in the southwestern corner of Lenoir County. Cypress trees line the edges of the V-shaped pond, which stretches for a mile up each of two tributaries. Built in 1850, the millpond has been a community gathering spot for a century and a half. The Parrott family, owner of the millpond, has allowed the public to fish for the price of $3 a day. They even rented their own fleet of handmade cypress rowboats until skyrocketing insurance rates forced them to abandon that service.

"We probably had several thousand people use the pond each year," says caretaker Carroll Stanley. "That included high school science classes looking at the ecology. We had wood ducks, muskrats, fox squirrels and otter. And, of course, we had lots of fish—chain pickerel, bream and bass. There were quite a few large ones taken out of here. Then, Hurricane Floyd came along."

Dumping nearly 21 inches of rain on the watershed in a 24-hour period, Floyd blew out the 1,000-yard-long earthen dam in several places, washing most of the fish downstream and leaving the ancient cypress trees standing high and dry. Owner Jim Parrott refused to write off the millpond and sought help in rebuilding the spillway and the dam. The Conservation Fund helped solicit a $10,000 grant from Progress Energy and a $5,000 grant from the N. C. Partners Program. The U.S. Department of Agriculture provided a grant from its Emergency Conservation Program, used for restoration of irrigation ponds. Lenoir County and the City of Kinston pitched

ILLUSTRATED BY DAVID WILLIAMS

in by providing earth moving equipment to rebuild the earthen portion of the dam. Parrott, in turn, welcomes the city and county to use the millpond for recreational programs.

Recognizing its value as a public fishing ground, the Wildlife Commission's Division of Inland Fisheries restocked the pond with 30,000 fish. The pond will be closed for fishing for two years to allow the fish a chance to get established.

Bennetts is another millpond that is being reborn as a community resource. Though the pond survived Hurricanes Fran and Floyd, the gristmill collapsed in 1986 after having been abandoned in the 1950s. Bob Harrell thought his granddaddy's favorite fishing hole would make a wonderful recreation center for the community. Upon becoming director in 1993 of the Albemarle Learning Center, a nonprofit education center promoting hands-on activities, Harrell approached the owners and negotiated a lease for use of the millpond. In 2002, the owners agreed to deed the millpond to Chowan County.

The county has since gotten grants to put in a nature trail, fishing pier and canoe launch. It has formed a millpond planning committee to tackle such issues as weed control. And it has developed a working relationship with The Science House at N.C. State University to use the millpond as a training ground for high school science teachers and students.

As our boat touches shore, I, too, feel imbued with the magic. The osprey settles back on her nest. Moccasins and turtles return to their logs. Somewhere under the dark water, half a dozen bass are wondering why they fell for that plastic worm. Dave, meanwhile, stews about the one that got away and plots his return. ⊠

The Old Gathering Place

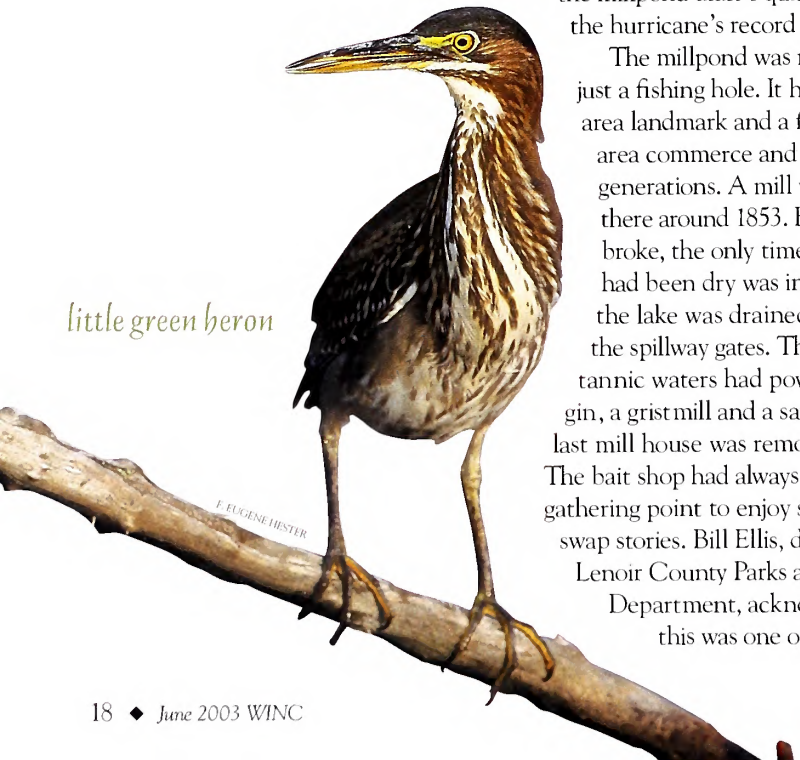
GEORGE HUMPHRIES

Destroyed by Hurricane Floyd, Tulls Millpond would not be forsaken by its owners or the surrounding community.

WRITTEN BY JIM SIMONS

Memories go back a long time at the 150-year-old Tulls Millpond near Deep Run in southern Lenoir County, but no one remembered it raining so hard for so long as it did on Sept. 16, 1999.

The torrential rainfall of Hurricane Floyd was different. A 32-foot-wide earthen section where the mill house once stood gave way. The flood wave sent 4 feet of water over the bridge downstream. The lake level slowly lowered. The 7 square miles draining into the millpond didn't quickly relinquish the hurricane's record rainfall.



little green heron

F. EUGENE HESTER

The millpond was more than just a fishing hole. It had been an area landmark and a focal point for area commerce and recreation for generations. A mill was first built there around 1853. Before the dam broke, the only time the lake bed had been dry was in 1917, when the lake was drained to rebuild the spillway gates. The millpond's tannic waters had powered a cotton gin, a gristmill and a sawmill until the last mill house was removed in 1955. The bait shop had always been a regular gathering point to enjoy soft drinks and swap stories. Bill Ellis, director of the Lenoir County Parks and Recreation Department, acknowledged that this was one of the prettiest millponds in the state and that everyone missed it. The Deep Run Fire Department had once used its waters for its fire trucks. In more recent times, its unique wildlife habitat provided a lot of interest for canoeists and bird watchers. Third-grade students had built bluebird boxes around the shore. Boy Scouts had built wood-duck boxes on the lake. Some families even held reunion picnics there. The millpond had always provided a variety of benefits to people and wildlife.

When the dam gave way, almost everything must have been washed downstream into Southwest Creek. Very little wildlife was seen waddling in the mud shortly after the lake drained. The newly uncovered lake bottom did reveal some interesting reminders of its past. Approximately 200 longleaf pine and cypress logs were found scattered in the mud. The lake had historically provided a convenient way to transport logs cut from the adjoining forest to the sawmill at the dam. Eight to 10 logs were banded together into rafts by strips of wood nailed across the top. Several rafts were tied together. The timber harvesters stood on the rafts and poled them down to the "log pound" holding area in front of the dam. While awaiting the saw, some of the logs sank and were never recovered. "Box-faced" chiseling scars dated some of the sunken longleaf pine logs to the 1800s and early 1900s. Back then, longleaf pine trees in the region were often chiseled to collect sap that was distilled for the flourishing turpentine business.

Just downstream of the dam, the force of the dam break was enough to wash an iron safe and cash

register from the stream bottom under the bridge onto the streambank. Probably the target of robberies sometime since the bridge was replaced in 1969, the contents had already been taken, except for $8 in pennies in the cash register. The door on the safe was found opened.

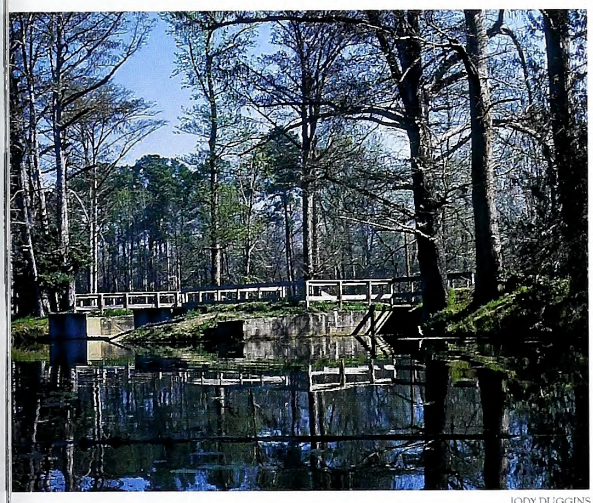
With an outpouring of moral support from the community, Jim Parrott, whose family has owned the millpond since 1983, sought an engineering firm to design the dam repairs as well as the funds to make them happen. Parrott called upon the millpond's multiuse history to pursue funding from a variety of government and nonprofit funding sources.

The Parrotts put up the rest of the money, and a repair plan was approved by the state on March 1, 2001. The rebuilding was finished by Sept. 15, and the lake started impounding again on Oct. 9 that same year. The lake water again flowed over the spillway the first of January 2002, following an unusually dry fall.

Prospects for future fishing at Tulls Millpond should be good, said Christian Waters, District 2 Fisheries Biologist with the N.C. Wildlife Resources Commission. In spring 2002, the Wildlife Commission stocked the millpond with thousands of bluegills, channel catfish and largemouth bass. Local anglers have transplanted mature bass, shellcrackers, flier, robin and perch. Southwest Creek will provide some natural restocking. By the summer of 2002, there were already signs of spawning fish. The new concrete boat ramp will provide better access for anglers.

This Hurricane Floyd recovery story has a happy ending. Parrott plans to reopen the lake to the public when the fish population can support fishing. The community is happy to be getting its millpond back. The locals report seeing as many mallards and wood ducks on the lake as ever. Some of the cypress trees appear to have survived the 28-month spell without the lake water. A conservation easement will help ensure that Tulls Millpond provides the wildlife sanctuary and water quality benefits that it has for 150 years.

When asked why he went to so much trouble to restore the lake with no obvious profit motive in sight, Parrott said, "It just seemed like the right thing for my family to do." Old-fashioned values and modern engineering should ensure that Tulls Millpond will provide a refuge for man and wildlife for generations to come. ⊠

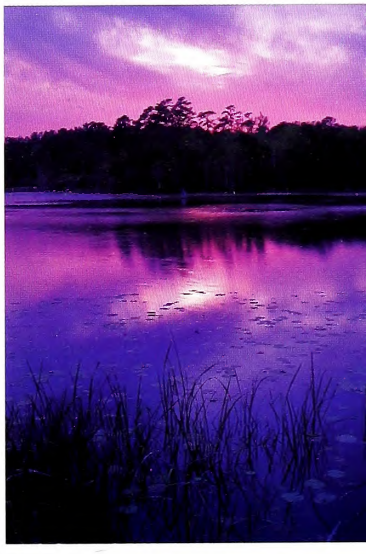


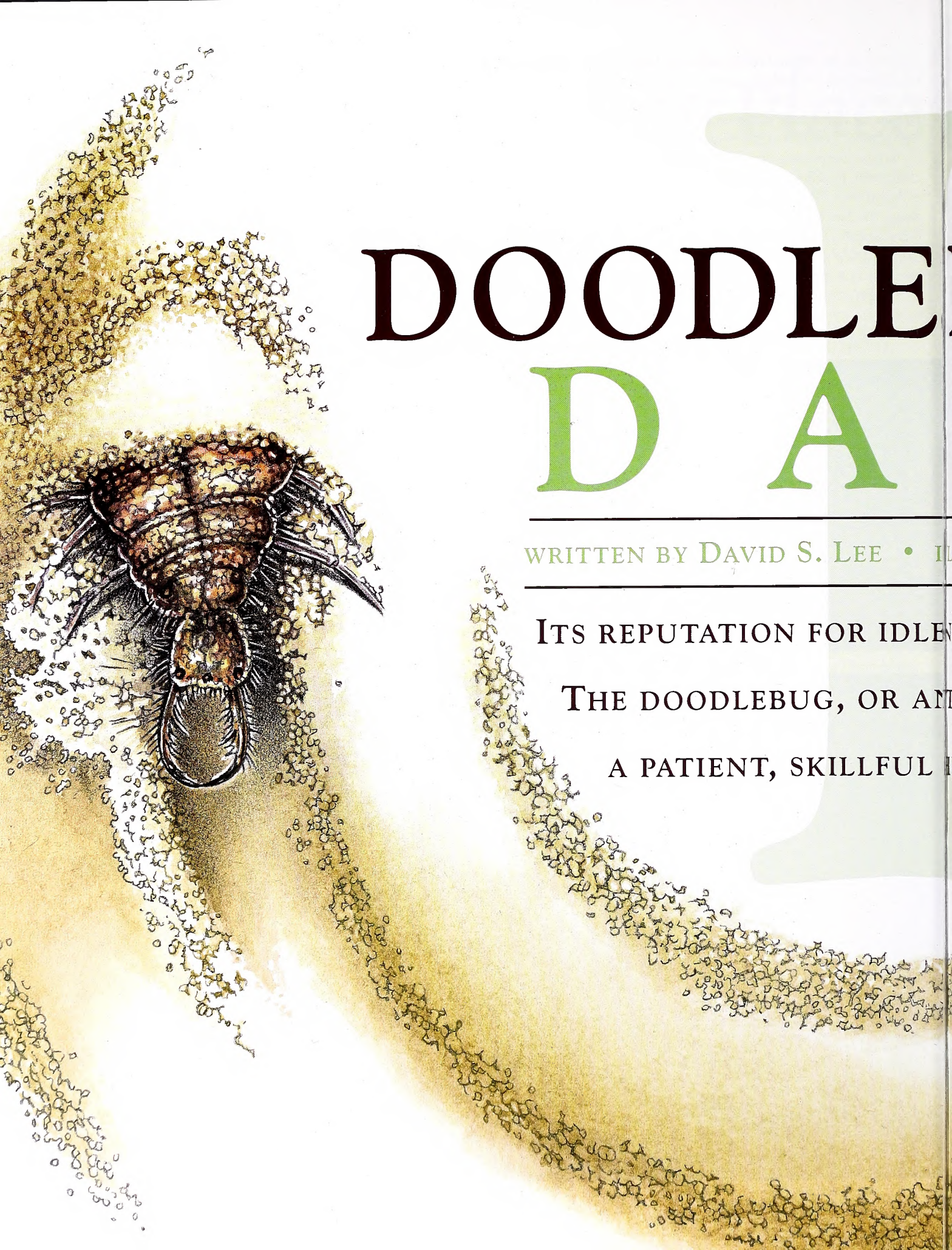
JODY DUGGINS

JODY DUGGINS

JIM PARROTT, *(left) whose family has owned Tulls Millpond since 1983, looks over some repairs with pond caretaker Carroll Stanley. The millpond's dam was washed away in 1999 during Hurricane Floyd and repaired in 2001.*

GEORGE HUMPHRIES





DOODLE
D A

WRITTEN BY DAVID S. LEE • I

ITS REPUTATION FOR IDLE

THE DOODLEBUG, OR AN

A PATIENT, SKILLFUL

BUG
Y S

LUSTRATED BY JIM BROWN

ESS IS EXAGGERATED.

T LION, IS ACTUALLY

UNTER-TRAPPER.

From our human perspective, doodlebugs appear as idle as their name would suggest. *Doodle*, according to dictionaries, means "to spend time idly" or "absentminded scribbling." We use this strange, fun word to describe not just the doodlebug lazing in its hole but also the woodcock, or "timber doodle," which endlessly, aimlessly probes for worms in alder thickets. I've even had a student named Doodle, which wasn't a nickname but the one that appeared on his official school record. His parents had the gift of foresight; by high school he had already perfected the concept of idleness and was working on it as a serious career option.

By contrast, the doodling bird is persistent, and the doodling bug is patient. Doodlebugs—or the larvae of ant lions, as most insect textbooks refer to them—lie in wait for days, perhaps weeks, waiting for their meal of choice, small ants, to tumble into their lairs. It's not idle time, but time spent doing the only thing the creature is programmed to do: tend the trap. It's a meager living, and the larval ant lion will spend one, two or three years obtaining enough meals to bring it to maturity. The difference between patience and doodling away time is all a matter of perspective, I suppose. Fishermen doodling away time can always stop on the way home for a Big Mac if they're unsuccessful; for ant lions, doodling is an obligate way of life.

Doodlebugs—"ant lions," if you must—are members of the order Neuroptera of four-winged, weak-flying, highly predaceous and mostly nocturnal insects. Relatives include dobsonflies, snakeflies and owlflies. Adult ant lions are beautiful—simple yet striking. The larvae, on the other hand, look like something designed for life in hell—or at least the *Star Wars* trilogy. (The funnel-shaped sand trap that the heroes escape in *Return of the Jedi* is actually very similar to a doodlebug's *modus operandi*.) Their maggotlike bodies support large, sickle-shaped jaws. These long, slender mandibles house canals that transport blood and body fluids from the victim to the ant lion's mouth. The three first segments of their bodies possess small, specialized jointed legs. And every body segment has short, stiff hairs that fan out along the sides. The good news is that even large ant lions are seldom a half-inch long.

Ant Trappers

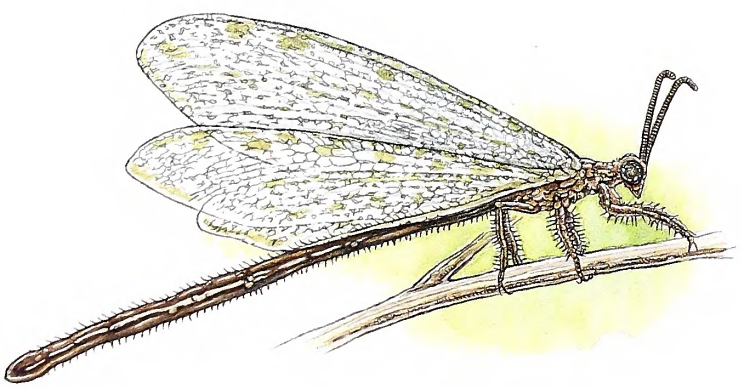
You can find doodlebug traps in almost any loose, small-grained soil. In open, sandy areas under barns or inside abandoned tobacco houses, there are often so many that the space resembles a miniature lunar landscape. Each trap is a simple, steep-sided pit. The cone-shaped traps vary in size from small to tiny, depending on the size of the larval ant lion. Older and bigger ones manage bigger traps that catch more and bigger prey. A funnel-shaped pit 2 inches across would be considered huge. The depth varies in proportion to the width of the opening. The sides typically have about a 45-degree slope, but the doodlebugs build them as steep-sloped as the soil can stand without constant slipping.

The traps are always dug in sites where the soil is sandy, or at least fine and crumbly. The most successful ant lions have traps in places protected from the wind and rain.

You have probably noticed that ants are very absorbed in their work. They are always on the move, scouting food sources and carrying choice food items back to their underground nests. They have no regard for topography and are forever traversing steep hills and canyons—from their perspective, anyway. The efficiency of ants is legendary, and direct paths to and from anywhere are the norm. So they are not likely to have any hesitation at all about ant lions. Successful ant lions excavate their traps close to places where ants travel.

It's hard enough to dig a pit in shifting sandy soil with a shovel, but try digging it out from the middle while sitting at the bottom. So how do you go about this if you are a small, weak-legged insect larva? Yep, you use your head. Larval ant lions have extremely broad, flat heads. With a quick jerk, they flip sand out of the pit and over the rim. Constantly turning, they evenly distribute the sand so that there are never any telltale piles of dirt next to the pits. They work from the outside in, beginning construction on the outer rim of the pit, tossing sand and creeping backwards in a perfect circle. The pit deepens and first looks like a circular trench. The insect then moves inward by a body width and continues. Each concentric circle deepens until the ant lion reaches the center, where it waits at the bottom.

When ants or other small insects stumble over the rim, the ant lion sets off miniature landslides that send the live prey tumbling down toward waiting jaws. Slipping and sliding over tumbling sand, the ants try to scramble upward. The activity is intense, and the timing of the created landslides makes the difference between a meal and more doodling. The prey often recovers and climbs back up the steep sides. If more landslides don't work, or if the victim continues to elude its jaws, the ant lion may pelt it with sand and knock it to the bottom



of the pit. Even for insects, it's nice to have a Plan B. The ant lion eats in vampire fashion, sucking the fluids and, with a toss of its head, discarding the empty carcass over the rim.

If you can get the doodlebug out of the sand to study it under a magnifying glass, you'll see a number of features that work in favor of its lifestyle. The flat body can quickly slip beneath the sand. Once below ground, the doodlebug can use the weight of the sand on its broad surface for extra mechanical advantage in sand tossing. Its jaws

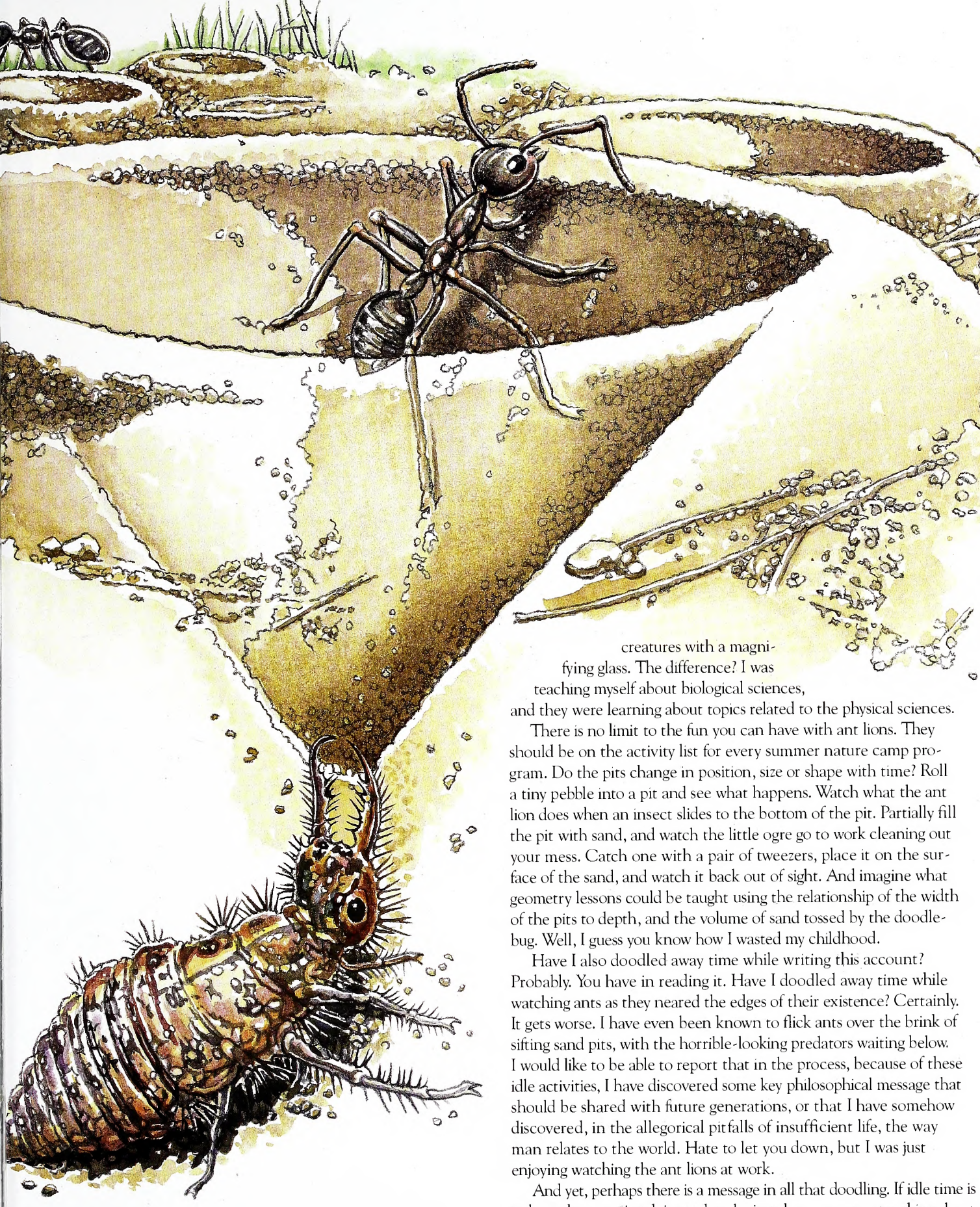
are strong, but its legs are not. Even a five-legged ant could easily outrun the swiftest of these "lions." Their six tiny legs are positioned backwards. In fact, ant lions have trouble walking in any direction other than in reverse. All the little joints are bending in exactly the opposite way from those of most insects. The crooked legs act as anchors to hold the ant lion at the bottom of the pit, and if modest-sized insects struggle, the backward-facing legs give the lion the advantage in any tug of war.

When the larvae are full-sized, they spin a perfectly globular cocoon made of silk and sand. The cocoon, about the size of a large pea, remains buried in the sand while the doodlebug changes to a pupa. When ready to emerge, the pupa pushes out of the cocoon, and through split skin the adult emerges. The 1 1/2-inch adult ant lions superficially resemble damselflies, but they are softer-bodied and hold their clear, sometimes spotted wings alongside their bodies instead of above them. Adult ant lions also have conspicuous knobs at the ends of their threadlike antennae.

The long, slender adults are fluttery, delicate and weak flyers. I often find them flapping about my lights on summer nights. After two or three years patiently waiting for the chance to emerge as free-flying adults, they are doomed to a life that is measured in days. Their only mission as adults is to make more ant lions.

Doodling with Doodles

If you are not inclined to lie about on your belly and watch doodlebugs doodle, you can bring them inside. As a boy, I used to catch them with small blades of stiff grass. They sometimes grabbed hold if I gently inserted the grass stem into the bottom of the pit. It's actually much easier just to scoop up a generous amount of sand from the base of the pit and take it home. Pour the sand—some extra from the site will help—onto a plate and smooth it out. Eventually, the larval ant lion will work its way to the surface and start to construct a new pit. Once the pit is finished, you can coach ants and other hapless insects toward it. I suppose doing that as a kid made me no better than the mean children who fried ants and other small



creatures with a magnifying glass. The difference? I was teaching myself about biological sciences, and they were learning about topics related to the physical sciences.

There is no limit to the fun you can have with ant lions. They should be on the activity list for every summer nature camp program. Do the pits change in position, size or shape with time? Roll a tiny pebble into a pit and see what happens. Watch what the ant lion does when an insect slides to the bottom of the pit. Partially fill the pit with sand, and watch the little ogre go to work cleaning out your mess. Catch one with a pair of tweezers, place it on the surface of the sand, and watch it back out of sight. And imagine what geometry lessons could be taught using the relationship of the width of the pits to depth, and the volume of sand tossed by the doodlebug. Well, I guess you know how I wasted my childhood.

Have I also doodled away time while writing this account? Probably. You have in reading it. Have I doodled away time while watching ants as they neared the edges of their existence? Certainly. It gets worse. I have even been known to flick ants over the brink of sifting sand pits, with the horrible-looking predators waiting below. I would like to be able to report that in the process, because of these idle activities, I have discovered some key philosophical message that should be shared with future generations, or that I have somehow discovered, in the allegorical pitfalls of insufficient life, the way man relates to the world. Hate to let you down, but I was just enjoying watching the ant lions at work.

And yet, perhaps there is a message in all that doodling. If idle time is to be truly appreciated, it needs to be just that—spent not rushing about from one recreational activity to the next, but just lying on your belly observing hungry ant lions as you, and they, doodle away the day. ⊠

go wild

Fisheries biologists reveal details about North Carolina's varied wild-trout streams.

written by
Jim Borawa

photographed by
Jody Duggins

Many anglers fish North Carolina's mountain trout streams and return home somewhat frustrated, because either most wild trout they caught were small (less than 8 inches) or other nontrout species kept hitting the lure or bait. This frustration often grows when one reads magazine articles about big trout, sees big trout being caught on television or has a friend lucky enough to land a big fish from a North Carolina wild trout stream. What most anglers don't know is how their catch measures up to what is really in the stream.

Between 1989 and 1996, N. C. Wildlife Resources Commission biologists sampled 17 trout streams to determine how trout and nontrout fish populations varied among streams and from year to year. Three of the streams sampled were on private lands and closed to fishing, six streams were under wild trout regulations and eight streams fell under catch-and-release regulations. The streams were sampled using backpack electrofishing gear with which the fish were stunned, captured, counted, measured and weighed.

After sampling thousands of fish, we came to the conclusion that there probably is no such thing as an average wild trout stream. Of the streams sampled, six contained only rainbow trout, two only native brook trout and one only brown trout. The other eight streams contained some mix of those species. We also found that the mix of trout species could change over the length of a stream. For instance, we might find brown and brook trout at the lower end of a stream and only brook trout farther up. Most streams averaged 400 to 725 trout per acre of water. However, on a yearly basis, the density of trout was as low as 200 per acre and as high as 1,530 per acre. Although the numbers of young trout (those less than 4 inches in length) were the most variable size group on a year-to-year basis, they consistently made up about 50 percent of the trout captured. The results of the surveys help provide answers to some commonly asked questions regarding mountain trout stream fishing.

RODNEY FOUSHEE

***Fisheries biologists** with the N.C. Wildlife Resources Commission use electricity to sample wild trout such as the brown on the facing page.*

Q *What are those pesky little fish that keep hitting my lure but that I never seem to catch?*

A Depending on what river drainage you are in, it could be one of many nontrout species present in North Carolina's trout streams. We captured 32 different nontrout species in our survey, and most streams contained between one and five of these. The most common nontrout species captured were rosyside dace, blacknose dace, sculpin and white suckers. One stream, Andrews Creek in the Catawba River drainage, contained no nontrout species at all, whereas Boone Fork in the Watauga River drainage, only 7 miles away, contained 20 nontrout species. In all cases, the number of nontrout species decreased as we sampled farther upstream. This is most likely because nontrout species are more numerous in portions of stream with lower gradients.

Q *Sometimes I catch a lot of fish and sometimes I don't. Just how many fish are in North Carolina's wild trout streams?*

A The number and sizes of fish you catch probably depend as much on the weather, water conditions, time of year and location you are fishing as they do on the number of fish present. We found overall that fish less than 4 inches long, regardless of species, made up about half of the 21,440 trout we sampled. These small fish are considered young-of-year. On average, they occurred at a density of about 500 per mile (or about one every 11 feet of stream). Fish in the 4- to 7-inch size range (these fish are typically 1 and 2 years old) made up about 36 percent of all trout sampled, and there were about 400 of them per mile (about one every 13 feet). Fish in the 7- to 12-inch size range accounted for only about 12 percent of fish captured. They were found at a density of about 125 per mile (one every 42 feet). Fish more than 12 inches long, the ones we all would like to catch, make up less than two percent of all fish captured and were present at an estimated density of fewer than five per mile (one every 1,100 feet). Although we found few rainbow and brook trout more than 10 inches, nine percent of the brown trout we captured exceeded this length.

Q *Why are there so many small fish, and why are the larger ones I catch often skinny?*

A As you can see, there are a lot of wild trout in our mountain streams, but few of them reach a large size. This is due mostly to the pristine nature of our trout streams and their low food productivity. Brown trout grow to larger sizes mainly because they can feed more effectively on small fish and crayfish, items that have more food value than insects, which are the primary food of brook and rainbow trout. The low production of food is also reflected in how plump, or fat, a fish is for a given length. Compared to the national average for wild, stream-resident trout, all three species of trout in North Carolina waters are about 10 percent thinner than would be expected. For instance, on average a 10-inch trout, expected to weigh 6.3 ounces, would weigh only 5.7 ounces, and a 20-inch trout, expected to weigh 3.3 pounds, would weigh just 2.9 pounds, in North Carolina.

After sampling thousands of fish, we came to the conclusion that there probably is no such thing as an average wild trout stream.

***In addition** to trout, North Carolina's mountain streams are home to numerous nongame species including (from top to bottom) mottled sculpin, bluehead chub and roseyside dace.*

RODNEY FOUSHEE

***After collecting** fish using electroshocking, biologists measure and weigh the various species found in a wild stream before releasing them.*

Q *If we stocked more fingerling trout, wouldn't we have more or bigger fish or both?*

A Our survey data show that even though the number of young trout varies dramatically from year to year, there is no significant change in the number of trout greater than 7 inches long in a given stream. Depending on the stream and year, we found between 141 and 1,197 young brook trout per mile, 84 to 735 young brown trout per mile, and 26 to 1,713 young rainbow trout per mile. We also discovered that the number of young-of-year trout varies a lot between locations sampled. For example, in Beetree Creek and North Fork Swannanoa River, two streams closed to fishing and containing only rainbow trout, the sample sites with the highest number of young fish were not the same from year to year. We suspect this is caused by the change in habitat quality within a sample site, and also that trout probably do not target specific stream locations for spawning. In either case, we found that the number of fish hatched each year has little impact on the number of fish reaching 7 inches. In fact, the number and average size of adult trout (those over 7 inches) varied little from year to year regardless of the number of young produced in previous years. Adding young fish in such a situation would do little to enhance the population and would be a waste of anglers' money.

Q *I have fished streams following floods, and there seem to be fewer fish then. Is this true?*

A Of all the things that impact our trout populations, floods seem to have the most dramatic effect—but it is typically a short-term effect. In three cases during our surveys, we found that the numbers of all sizes of trout present were at least 60 percent lower following floods during the previous year. However, natural reproduction in the subsequent two years was above normal, and after two years, the populations were about the same as before the floods. Nature has adapted these populations to be very resilient.

Q *What effect have acid rain and the recent drought had on our wild trout populations?*

A Though our survey covered only a relatively short time period, and not the most recent years of drought, there seems to be little change in our fish populations due to these factors. We located data from the 1960s for some streams in our recent survey and found that the species present (both trout and nontrout) and their densities had changed little. If anything, the low, stable water levels of the drought appear to be allowing for consistent crops of young fish, but they also have reduced the amount of habitat available for larger fish. Hopefully, rainfall levels will return to normal soon.

Q *Is it true that those streams closed to fishing or under catch-and-release regulations had the biggest fish?*

A Although this survey wasn't designed to test the effects of regulations, the size of fish we found in a given stream had more to do with the species present than the regulation in effect. The average size of trout present in all streams varied little from year to year, and most anglers would be unable to detect a difference in their catch between wild trout streams open to harvest and those under catch-and-release regulations or closed to fishing altogether. Streams containing brown trout had more large fish than did those containing rainbow or brook trout, simply because brown trout tend to live longer and are more efficient at using the limited food supplies in North Carolina's trout streams. Fishing harvest also appears to have little effect on the average size of trout present. Using creel survey data, we could detect no significant changes in the average size of trout where the harvest of wild fish is allowed. It appears that when fish are harvested there are ample numbers of fish ready to grow to replace them. Fish more than 16 inches long were a rare find in our surveys, as they were in the 1960s.

brook trout

Q *How do our streams compare to others in the Southeast?*

A For streams of comparable size (less than 40 feet average width) in the Southeast, our streams appear to have similar densities and sizes of fish. There are, however, streams that produce larger fish because of unique circumstances. These are typically larger waters that have higher nutrient levels than do most wild trout streams in North Carolina. The reservoir tailwaters in Tennessee are an example of streams with these characteristics.

Q *So, what does all this mean for anglers fishing North Carolina's wild trout streams?*

A It appears that the fish populations have changed little since the 1960s, so the chances of catching fish should be as good as ever. However, trout fishing is more popular now, and this means more people on the streams. Anglers willing to hike a mile or so will often have a stream to themselves and have the opportunity to fish in solitude. Unless you have fished a stream before, each one should hold a few surprises in terms of the species, sizes or numbers of fish you will catch. Because fish populations vary so much from stream to stream and year to year, each fishing trip can be considered unique, because there probably is no such thing as an average trout stream. And though we have shown you what is in North Carolina's wild trout streams, it is still up to you to figure out how to catch those trout. ⊠

rainbow trout

Brown trout *and rainbows can be found in the lower elevations of North Carolina's wild trout waters, while native brookies survive in the tight confines of the higher elevations.*

Jim Borawa is a fisheries biologist with the N. C. Wildlife Resources Commission.

Crows, jays and ravens are familiar sights in North Carolina, but they're not just pretty feathered faces. Here and around the world, they're

Bird Brains

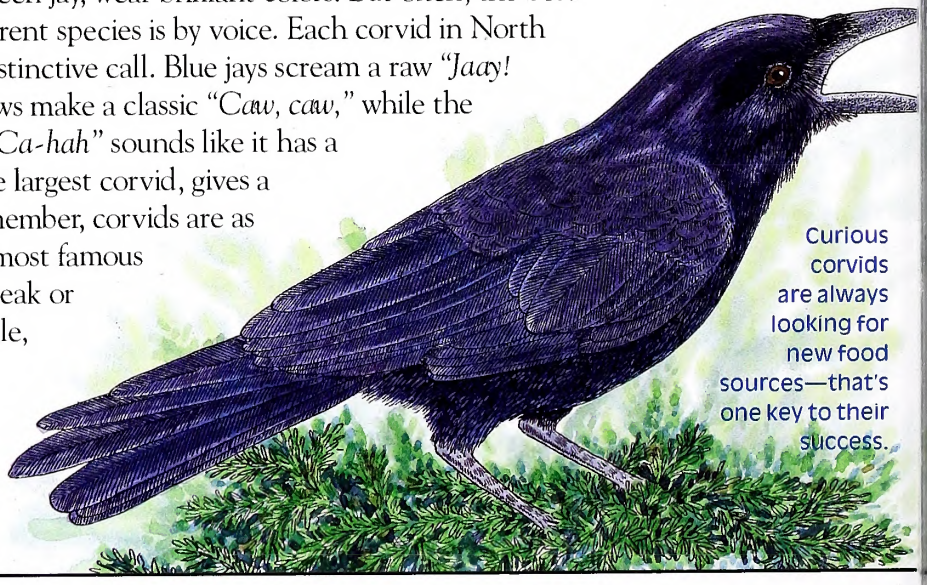
written by Julie Dunlap / illustrated by Consie Powell
nature activity by Anne M. Runyon

Crooooaaak!

Welcome to the Family

What birds can solve puzzles, count up to seven and score better than monkeys on some intelligence tests? Such smarts have helped make the **corvid** family successful. The ability to **adapt**, or change, their behavior to match their surroundings allows corvids to live anywhere from the Arctic tundra to tropical rainforests to your backyard. Whether people like them or not, almost everyone knows crows and other clever corvids.

Some birds in the family, such as blue jays, sport bold patterns while others, such as Mexico's green jay, wear brilliant colors. But often, the best way to identify different species is by voice. Each corvid in North Carolina boasts a distinctive call. Blue jays scream a raw "*Jaay! Jaay!*" American crows make a classic "*Caw, caw,*" while the look-alike fish crow's "*Ca-hah*" sounds like it has a stuffy nose. The common raven, the largest corvid, gives a deep "*Croooaaak*" or "*Cur-ruk.*" But remember, corvids are as talkative as they are smart. Besides their most famous calls, each species may rattle, whistle, squeak or mimic other animals. Blue jays, for example, copy the "*keee-r-r*" cry of red-tailed hawks. Crows and ravens are the copycats of the bird world, mimicking everything from roosters to dogs to car horns.



Curious corvids are always looking for new food sources—that's one key to their success.

Some corvid parents (such as Florida scrub jays and sometimes American crows) allow last year's offspring to help them raise their new nestlings.

CAWS FOR ALARM

What's all that bird talk about? Highly **social** animals, corvids have lots to say to family and other flock members. When a raven coos to its mate, it seems to say, *"Hello, it's me."* Young jays crying in the nest seem to shout, *"Feed me! Feed me NOW!"* Biologists have carefully studied the language of American crows and found that the number and pattern of *"caws"* carry messages to other birds. A slow pattern, *"Caw . . . Caw . . . Caw . . ."* means *"All's well,"* but a quick, sharp *"Caw! Caw! Caw!"* alerts the flock to danger. Each crow even has a unique set of *"caws"* that it uses like a name to say, *"I'm here."* And if a crow's mate is missing, it will call the other's name while flying to find its partner.

Their talking talents help corvids work together. When feeding in an open field, a crow flock posts one or two members on fences as lookouts. If one of the **sentinels** spots danger, its alarm calls tell the others to flee. Crows, ravens and jays all screech when they spot an enemy. Their cries attract other birds, and soon a gang of angry corvids is dive-bombing the unwanted intruder. Corvids mob (or attack) eagles, hawks, foxes and especially owls. Great horned owls steal young crows and ravens from their nests and snatch adults from their evening roosts.

FOOD FOR THOUGHT

Eating eggs and baby birds sometimes makes corvids unpopular. They're also called pests for gobbling farm crops, scaring other birds from feeders and poking around dumpsters for garbage. But crows and their relatives eat plenty of wild food, too. Depending on the species, they eat everything from seeds, berries and caterpillars to fish and deer meat.

Caw! Caw!

Corvids are **opportunists**, ready to eat whatever they can get. Their diet changes from morning to night and from season to season.

Ca-hah!

Sometimes, the birds gather more food than they can eat right away. In the fall, blue jays collect acorns and beech **mast**, then bury them in the ground. How do they find their food **caches** later? Biologists think jays have excellent memories and can recall exactly where to find their stores, even under winter snow.

Corvids invent ways to get more food, too. American crows pound acorns with stones to break the nuts open, and fish crows and ravens drop clams on paved roads to crack the shells.

Corvids are playful—they play catch with themselves, tug-of-war with each other, and goof around just like kids do.

Worldwide, 118 species of corvids are found on every continent except Antarctica.

Hello, Neighbor

In North Carolina, crows, jays and ravens live in cities, farm country and the mountain wilds. Across the nation, they are learning to live in new places every year. That bothers people who think of them as pests. Some people shoot crows or explode firecrackers near their roost to scare them away. But people who know corvids usually welcome the birds. Who wouldn't want such brainy neighbors?

If one jay caches food while a second jay watches, there's a chance that the second jay might steal the first jay's food when it gets a chance. But if the first jay knows it is being watched, it will return later when nobody's looking and recache its food where it won't be pilfered.

What Does It Mean?

adapt: able to change to meet different environmental conditions
caches: holes or other places to hide food to eat later
corvid: a medium to large perching bird with strong feet and bill
mast: tree nuts lying on the forest floor
opportunists: animals that use every chance they can to get food they need
sentinels: birds that watch over the rest of the flock and warn others of danger
social: animals that live around others of their kind

Read and Find Out

- *Bird Brains* by Candace Savage, Sierra Club Books, 1995.
- *Listen to the Crows* by Laurence Pringle, Thomas Crowell, 1976.
- *The Mind of the Raven* by Bernd Heinrich, Cliff Street Books, 1999.
- *The Sibley Guide to Bird Life and Behavior* edited by Chris Elphick, John Dunning Jr. and David Allen Sibley, Knopf, 2001.

On the World Wide Web:

- http://birds.cornell.edu/crows/crowfaq.htm

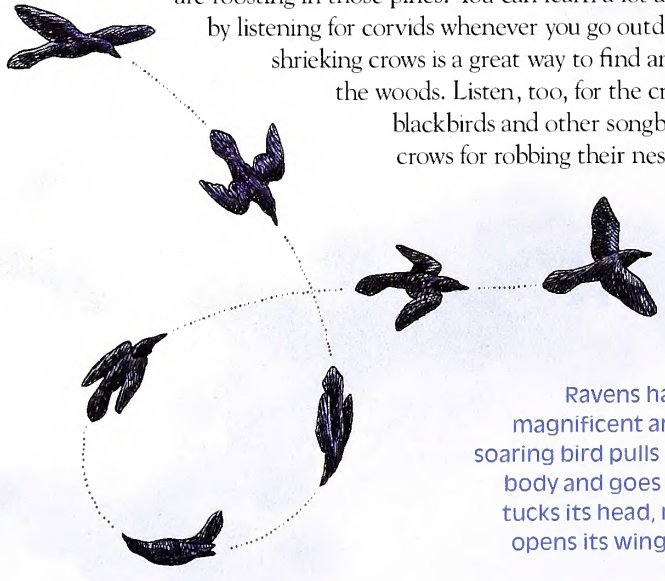
In *Wildlife in North Carolina*:

- "Big Bird of the Appalachians" by Lawrence S. Earley, December 1985

Get Outside

Make a corvid calendar. Corvids are unusually quiet during nesting season. If you see one catch a caterpillar and fly into a tree, keep watching. You might have found its nest. In the fall, you might spy blue jays migrating south in small groups or non-migrating jays stashing away acorns. Winter crow roosts can be found by watching where the birds come from in the morning or where they head each night after feeding. And pay attention in late winter for ravens gathering twigs to build nests. By keeping notes on all you see during the year, you'll learn about how changing behaviors help corvids adapt to the seasons.

Take a sound safari. How many different calls can a blue jay make? What are those ravens croaking about in the treetops? How many crows are roosting in those pines? You can learn a lot about bird behavior by listening for corvids whenever you go outdoors. Listening for shrieking crows is a great way to find an owl or hawk in the woods. Listen, too, for the cries of redwinged blackbirds and other songbirds that mob crows for robbing their nests.



Ravens have been seen doing magnificent arial somersaults. The soaring bird pulls its wings close to its body and goes into free fall. Then it tucks its head, rolls through the air, opens its wings again, and flies on.

It's WILD!

Project WILD activities for teachers and students that correlate to this topic include the following:

Bird Song Survey teaches students to understand the importance of bird counting as a means of inventorying wildlife populations.

Keeping Score teaches students to understand cause-and-effect relationships that help and hinder wildlife in their community.

In North Carolina, you'll find ravens in the west, fish crows in the Piedmont and east, and American crows and bluejays everywhere.

blue jay

Get WILD

WILD Workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD Workshops, connect to the commission's online Web site at www.ncwildlife.org and click the link for education/workshops.

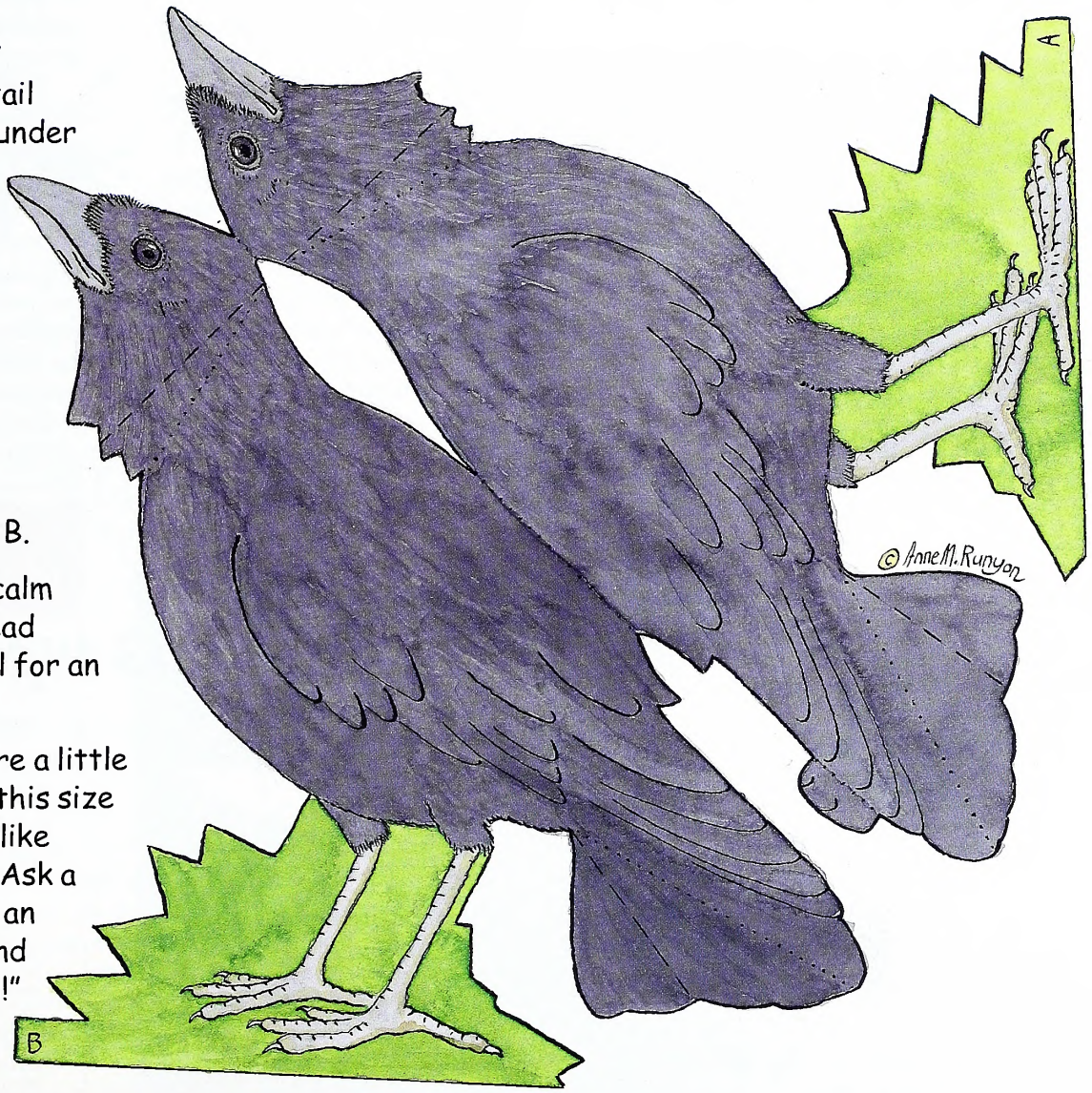
fish crow

American crow

raven

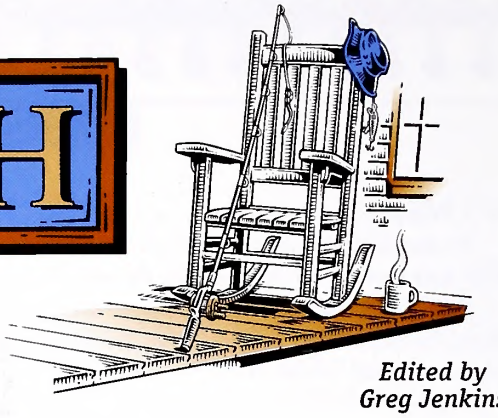
Calm Crow, Excited Crow. . . Make A Fish Crow Sculpture

1. Cut out fish crow.
2. Tuck throat and tail display feathers under each side by folding down along ··· lines, and up along --- lines.
3. Fold crow in half.
4. Fold down and glue tab to tail.
5. Glue tab A to tab B.
6. You have made a calm crow. Now pull head up and spread tail for an excited crow.
7. Real fish crows are a little more than twice this size and do not "Caw" like American crows. Ask a fish crow if he is an American crow and he'll say "Huh-Uh!" ("No Way!")



BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

Proposed Legislation Would Protect Native Turtles

The N.C. Wildlife Resources Commission is seeking to protect reptiles and amphibians from excessive commercial harvest. In March, the Wildlife Commission unanimously approved a resolution calling on the General Assembly to amend the state's endangered species laws. The intent is to give the commission authority to regulate species not identified as threatened or endangered, yet evidence exists that there is a need for conservation measures.

CURTIS WOOTEN

***The painted turtle could benefit** from legislation that would limit the number of reptiles and amphibians commercially harvested in the state.*

The Wildlife Commission wants restrictions on commercial taking of large, basking turtles of the families Emydidae and Trionychidae. These would include familiar, yet increasingly rare, species such as painted and eastern box turtles, as well as the sliders and both softshell species native to North Carolina. David Cobb, chief of the commission's Division of Wildlife Management, said growing commercial collection of those long-lived, slow-reproducing species is driving the need for enhanced protection. Demand is tremendous overseas for turtles to use in the preparation of food and medicine.

If enacted, the law would still allow some collecting by professional researchers, commercial collectors and amateurs, although the numbers anyone could have on hand would be limited to four reptiles and 24 amphibians. Bullfrog giggers or anglers who take snapping turtles won't need to worry about violating the law, Cobb said, because the commission has not identified those species as requiring protection.

The law would not restrict development of one's property.

A rising tide of turtle collections

In only two years, the number of turtles commercial collectors reported in North Carolina has risen by more than 5,000 percent. Dealers fetch high prices from reptile collectors for species that are becoming increasingly rare.

YEAR	TURTLES COLLECTED
2000	460
2001	1,679
2002	23,242

SOURCE: N.C. WILDLIFE RESOURCES COMMISSION, DIVISION OF WILDLIFE MANAGEMENT

New Saltwater Limits Set for Recreational Anglers

MELISSA McGAW

The North Carolina Division of Marine Fisheries recently announced changes to the saltwater recreational limits for weakfish, bluefish and ocean-caught flounder.

- The new minimum size limit for weakfish, commonly known as gray trout, will be seven fish per day at a minimum size limit of 12 inches in all coastal and ocean waters.
- Anglers may keep up to 15 bluefish, but only five of those fish may be over 24 inches. There is no minimum size limit.
- The size limit for ocean-caught flounder was reduced to 15 inches per day, and anglers can keep up to eight of these fish. The size limit remains at 14 inches, with no bag limit, for flounder harvested in internal waters.

Visit http://www.ncdmf.net/recgide.htm to view or download a copy of the most recent recreational fishing guide.

Fruits and Nuts and Candy

There once was a time when no homestead was complete without the addition of a few fruit and nut trees in the yard. For farmers, these trees were high-yield investments, producing bushels of dividends with very little sweat equity.

And though that remains true in rural North Carolina, the same cannot be said for the suburbs, which are dominated by pine and oaks. It's a shame, because the ground where a housing development now stands is most likely a former farm—perfect soil for growing fruit trees. In addition, these trees are excellent for wildlife viewing, attracting numerous species to feed on fruits, seeds or insects drawn to the trees.

Two years ago, I planted a small peach tree in my front yard. It's getting some size now, but not yet ready to bear fruit. Even so, I already gain immense satisfaction knowing that someday I will be racing my local squirrel population to some of nature's finest candy.

—*Chris Powell*

Barger Named Wildlife Officer of the Year

For Wes Barger, 2002 was a rewarding year professionally. He made a big arrest of a Johnston County man who was trapping and killing raptors, and he made great strides toward educating the Spanish-speaking public about wildlife regulations. For his determination and success patrolling an area where complex problems between hunters, fishermen and landowners are common, Barger was named the 2002 Wildlife Enforcement Officer of the Year.

STEVE WILSON

***Wes Barger (center)** was named 2002 Wildlife Officer of the Year. Wildlife Enforcement Capt. Ken Craft (left) and Col. Roger LeQuire were on hand for the awards ceremony.*

"It's something that's a once in a lifetime deal," Barger said. "I was humbled by this award."

In 10 years on the job, Barger has developed a reputation for relentlessly pursuing violators of all types. Early last year, after hearing that a man was trapping hawks and owls, Barger staked out the man's property for more than a month until he was able to catch the perpetrator on videotape.

Maintaining a good relationship with the public is important to Barger, so he took a Spanish class at Vance-Granville Community College so he could more easily communicate with the large numbers of Latino residents in his patrol territory of Wake, Johnston and Wayne counties. His new language skills enable him to explain laws, fines, court dates and other important information to those people who understand Spanish better than English.

"That has helped me in my job tremendously," Barger said. "It puts them at ease when you can explain things to them."

Barger's story is even more impressive because he was involved in a near-fatal auto accident in 1995 that kept him in the hospital for weeks and out of work for 18 months. He is now back to 100 percent. Barger's motivation to do a great job comes from his childhood in Rowan County, where he was taught to respect wildlife and the environment. While Barger says he is "not on a crusade," it is very important to him that the state's natural resources be protected so his son, Garrett, now 22 months old, will have a place to hunt and fish when he is old enough. Barger, his wife, Shannon, and Garrett live in Youngsville.

The officer of the year award was recently presented to Barger, 31, at the Governor's Conservation Achievement Awards banquet. For 41 years, the program has been conferred jointly by the N.C. Wildlife Federation and the National Wildlife Federation through an agreement with the governor's office.

Mobile Exhibit Offers a 'Virtual Safari'

North Carolina's native wildlife species are traveling around the state, offering a close-up and hands-on educational experience.

The Sensory Safari was created jointly by the N.C. Wildlife Resources Commission's Division of Enforcement and the Triangle chapter of Safari Club International. On display in the 36-foot, walk-in trailer are dozens of pelts, mounted heads and entire bodies of various game and nongame species: deer, bears, fowl, squirrels, a tusked hog, even a hawk clutching a mouse. The items, most of which were donated by taxidermists and private citizens, aren't just for viewing—touching is encouraged.

"We don't want to say to kids, 'Don't touch,' " said Chuck Blalock of the Triangle Safari Club. "If they wear out, we'll get another specimen."

Capt. Mike Bogdanowicz with the wildlife enforcement division said the Safari Club "approached us with the concept. We built the exhibit with a focus on North Carolina species and made it educational and interactive."

JODY DUGGINS

Also mounted on the walls are signs and placards explaining wildlife management and the role of hunters and nonhunters. Wildlife enforcement, hunter education and the reason for game laws are also explained. The Sensory Safari will travel to special events such as fairs, hunting expos and other events.

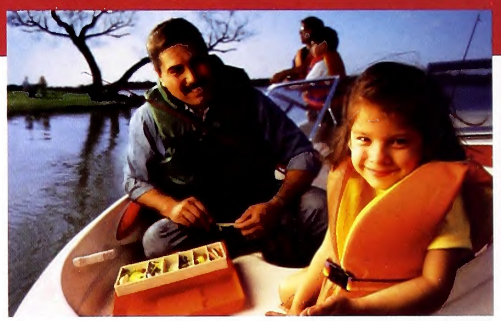
Magazine Rates Increase

It's been 13 years since we had to do this, but rising costs have forced us to raise the subscription price for *Wildlife in North Carolina*. Effective July 1, the price of a one-year subscription to the magazine will increase from $7.50 per year to $12 per year (that's $1 per issue). The price of a three-year subscription will increase from $20 to $30 for the period. And a lifetime magazine subscription will increase from $100 to $150.

This is the magazine's first price hike since 1990.

Subscription orders postmarked no later than June 30, 2003, will be honored at the old rate. That means it's not too late to sign up yourself or a friend at the old rate (see convenient order form at the front of this magazine issue).

National Fishing and Boating Week Set for June 1–8



WWW.WATERWORKSWONDERS.ORG

Looking to spend more time with your kids? Few activities can bond a family together like fishing and boating. National Fishing and Boating Week, scheduled for June 1-8, is an ideal time to get your family on the water to talk, laugh and create new memories.

During National Fishing and Boating Week, the U.S. Forest Service, various city and county recreation and parks departments and the N.C. Wildlife Resources Commission will host free fishing events for young anglers. More than 2,000 children are expected to attend these events, catching wild and commission-stocked fishes in a variety of waters across the state, from trout in the mountains to catfish and sunfish in the Piedmont and coastal regions.

Registered participants may enter a statewide drawing for prizes, including rods, reels, tackle boxes and spools of fishing line. Grand prizes will be lifetime comprehensive fishing licenses, valued at $250 each. Local sponsors for each event will also provide prizes and giveaways for participants.

"All of our sponsors have been very supportive of North Carolina anglers of all ages, particularly the U.S. Forest Service that organizes and hosts many of these events," said Fred Harris, chief of the commission's Division of Inland Fisheries. "The commission appreciates everyone's support of our aquatic outreach efforts and shares with them the desire to see these fishing events instill in children a passion for fishing and, more importantly, a passion for our state's natural resources."

For a listing of National Fishing and Boating Week events, visit the commission's Web site, www.ncwildlife.org.

Nature's Ways

Amphibious Activities

written by Brad Deen
illustrated by David Williams

Beavers spend as much as half their time in the water. Even in winter, the busy rodents commonly spend two hours each day paddling and diving.

A host of adaptations supports their semiaquatic lifestyle. A clear, protective layer over the beaver's eyes, called the nictitating membrane, functions like goggles. Flaps of skin in the ears and nose close like valves to keep water out. Another valve between its mouth and chisel-like incisors allows the beaver to gnaw wood while submerged. It can even chew with its side teeth underwater, thanks to a tongue that fits like a stopper against the throat.

Despite its appearance, the beaver's tail doesn't paddle it through the water. The tail acts as a rudder and stabilizer for the torpedo-shaped body. Propulsion is generated by powerful, webbed rear feet. Special grooming claws waterproof the thick fur by combing a secreted oil through it. A dense inner coat traps air, insulating against watery chill. Further protection against cold comes though a metabolic trick. Just before the beaver dives, its body temperature rises a degree or two, granting a few extra moments underwater before it must take to land or lodge.

Stored fat also provides insulation—as well as buoyancy, which American Indian hunters well knew. A swimming beaver killed in the spring or summer, when its fatty layers are thinnest, would sink to the bottom, potentially unrecoverable.

Calendar of Events

Sunday, June 1

Volunteers can help upgrade the trails at Grandfather Mountain for National Trails Day. Call toll-free (800) 468-7325, or log onto www.grandfather.com.

Friday, June 6

The Fourth Annual Rachel Carson Birthday Celebration in Beaufort will commemorate the life of the writer and naturalist, for whom the nearby Rachel Carson National Estuarine Research Reserve is named. Call (252) 728-2170, or log onto www.ncnerr.org/cerf.

Saturday, June 7

National Trails Day, celebrated by the Greensboro Parks and Recreation Department, will feature hiking, biking and displays by local clubs and outdoor retailers. Call (336) 545-5961.

Saturday, June 14

The Cape Lookout lighthouse postage stamp will be unveiled at the Core Sound Waterfowl Museum at 9 a.m. From June 16–21, a temporary Cape Lookout Post Office Station will be open daily for stamp cancellation and mailings. Call the museum at (252) 728-1500 or visit www.coresound.com.

Sunday, June 15

Father's Day in the Forest at the Cradle of Forestry in America, located in Pisgah Forest near Brevard, will feature fly-fishing, compass games, Frisbee golf and guided hikes. Call toll-free (800) 660-0671, or log onto www.cradleofforestry.com.

Reoders should check with the contoct listed before trovel-ing to on event. Items for listing should be conservotion-oriented ond should be submitted ot leost four months in odvonce to greg.jenkins @ncwildlife.org, or coll (919) 733-7123, Ext. 264.

2003 Waterfowl Stamp Goes on Sale July 1

The N.C. Wildlife Resources Commission unveiled its 2003 Waterfowl Stamp and Print at the opening reception of the 8th Annual East Carolina Wildlife Arts Festival. The reception, held at the Washington Civic Center in Beaufort County, was sponsored by the East Carolina Wildfowl Guild.

The oil painting "Traditions at Suggs Mill Pond" by Wilhelm Goebel, portrays the artist, along with his daughter, Kimberly, hunting ring-necked ducks at Suggs Mill Pond Game Lands, located in Bladen and Cumberland counties. It is the second in a series of five paintings that reflects waterfowl hunting traditions on commission-owned game lands and impoundments.

"This painting is especially meaningful because it highlights the importance of having more women participate in the sport of shooting and hunting," Goebel said. "Most hunting scenes are very male-oriented. Being that I have two daughters, it seemed natural for me to incorporate one of them into the painting."

This is the second time Goebel's artwork has been selected for the North Carolina Waterfowl Stamp and Print. In 1997, his oil-on-canvas portrayal of a pair of wood ducks flying over Orton Plantation sold more than 1,300 copies and generated $52,311 for the North Carolina Waterfowl Fund.

The Commission initiated a waterfowl conservation stamp and print program in 1983 to generate funds for waterfowl conservation in the state, including acquiring and improving habitat. Money from the sale of stamps and prints goes into the waterfowl fund. The 2003 stamp will go on sale July 1, and costs $10. The signed and numbered regular edition print with mint stamp will also be available July 1 and will sell for $145. For more information on the 2003 Waterfowl stamp or the North Carolina Waterfowl Fund, contact the commission at 1-866-WILDSHOP (1-866-945-3746) or 919-662-4377, or visit the NC WILD Store online at www.ncwildlife.org.

did YOU know?

People who spend time freshwater fishing from a bank or boat are likely to encounter two types of snakes: cottonmouths and water snakes. The two snakes look very similar, but the cottonmouth (water moccasin) is venomous while the water snake is not.

So if one drops into your boat, how do you know whether to shoo it away or dive overboard? The cottonmouth has dark bands across its body, and the water snake has alternating splotches. If the snake is coiled around a limb 10 to 15 feet in the air it is likely a water snake; they climb higher than cottonmouths. A water snake is also quick to spook, disappearing in a flash. A cottonmouth, on the other hand, prefers a dignified slow retreat and may even stand its ground, opening its mouth to reveal its trademark white lining.

Finally, a cottonmouth swims with most of its body above the water. A water snake swims with just its head protruding. Regardless of which snake you happen upon, don't harm it. The snake has every bit as much right to enjoy the river as you do.

For Fishing, Rhodhiss is the Class of the Catawba

When it comes to fishing the lakes along the Catawba River, bigger is definitely not better. Duke Energy has surveyed the river's lakes for a decade, and has determined that tiny Lake Rhodhiss between Morganton and Hickory has the densest population of fish. Lake Norman, the largest in the chain, is the least productive.

Rhodhiss averages 605.8 pounds of fish per mile, compared to 103.5 for Norman. Rhodhiss contains mostly sunfish, largemouth bass, crappie, redbreast, white catfish, white perch and bullheads. The lake is especially bountiful because it has abundant woody debris that provides hiding places. In 1989, Hurricane Hugo blew down trees along 90 miles of the Lake Rhodhiss shoreline.

CURTIS WOOTEN

Fishing pressure at Rhodhiss is also relatively light, and certain species appear to be larger. Surveys indicated that largemouth bass as big as 8 to 12 pounds can be found there, compared to 5- to 8-pounders in heavily fished Lake Wylie.

Proposed Rule Allows States to Control Cormorants

MELISSA McGAW

The U.S. Fish and Wildlife Service is proposing a rule that will allow state agencies to more easily control the populations of the double-crested cormorant, a colonial waterbird whose numbers have increased substantially in the past 30 years. The rule would help reduce conflicts with human activities such as recreational fishing and commercial aquaculture. Currently, agencies must first receive a federal permit in order to control the birds.

Under the proposed rule, a previous 1998 aquaculture depredation order would remain in effect and continue to allow double-crested cormorants to be taken at commercial freshwater aquaculture facilities and state-owned fish hatcheries in North Carolina and 12 other states, and would be expanded to authorize winter roost control by wildlife services in those states. Between 1970 and 1991 in the Great Lakes region of the United States and Canada, the number of double-crested cormorant nests increased from 89 to 38,000. By 1997, the Great Lakes population had reached approximately 93,000 pairs and was recently estimated at 115,000 pairs. The total North American population of double-crested cormorants is approximately 2 million birds.

"The new rule will give local authorities a more active role in double-crested cormorant management," said Steve Williams, director of the U.S. Fish and Wildlife Service. "Since this bird's population is increasing and they have been shown to cause local impacts to natural and economic resources, we believe local management with national oversight is the best approach to reduce conflicts."

Catch Us at these *Numbers*

1-800-662-7137 to report violations of hunting and fishing laws
1-800-628-3773 (NC VESSEL) for boat registration and titling
1-800-675-0263 for hunting dates and shooting hours for migratory game birds
1-888-248-6834 (2HUNTFISH) to purchase most licenses with VISA or MasterCard using a touch-tone telephone
1-800-446-8663 (I GOT ONE) to report big game harvests
Connect to the Wildlife Commission's online Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $51,963,707.90

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

On Patrol

For many of us, our memorable firsts—first step, first word, first date—wouldn't include a first wildlife violation.

While patrolling the Cape Fear River in Bladen County last year, Wildlife Officer Sam Craft checked a couple fishing at Lock and Dam No. 1. The woman did not have a fishing license. Craft said he would have to issue her a citation.

"Oh, my first wildlife citation!" the woman exclaimed. "I can't wait to tell my friends!"

Her excitement ebbed when she learned the ticket would cost her $115.

ILLUSTRATED BY JACKIE PITTMAN

N.C. WILD STORE

TWO for the road . . .

Travel far afield with a seasoned storyteller. Jim Dean's hunting and fishing stories evoke the reverie of wild places and the simple pleasures of rural life. Each of these two book-length collections represents some of his best writing, arranged to follow the course of a year outdoors.

DOGS THAT POINT, FISH THAT BITE
A collection of 50 essays originally published in Dean's "Natural Heritage" column for *Wildlife in North Carolina* magazine.
Hardbound ~~$19.95~~ $14.95 ITEM CODE **M8**
Paperback ~~$10.95~~ $8.00 ITEM CODE **M12**

THE SECRET LIVES OF FISHERMEN
Thirty-nine essays about life as a fisherman written for outdoor magazines.
Hardbound ~~$24.95~~ $18.50 ITEM CODE **M13**

SET OF BOTH VOLUMES
With this special offer, you can add to your library and remember friends too.
Hardbound $30.00
ITEM CODE **M14**

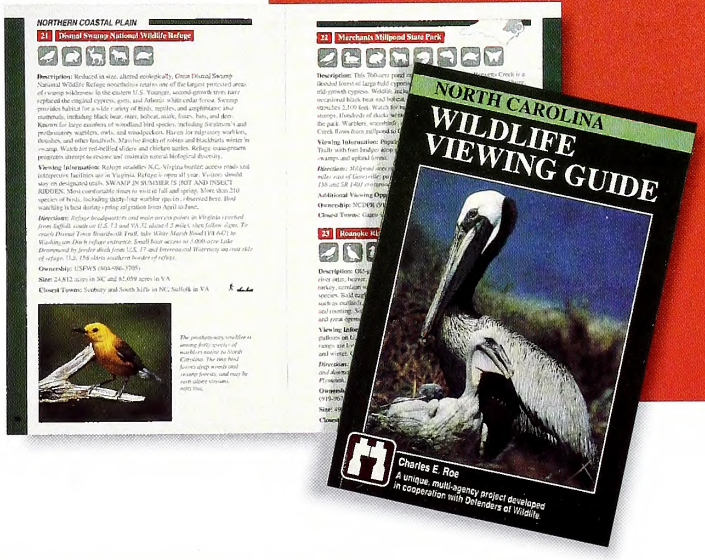
"It's best to leave around 6:30 in the morning while it's still cool and the traffic is light. Head east and pick the back roads where you can drive 45 miles an hour or less without holding up a long line of traffic. Roll down the window and listen to the buzz of insects in the fields and ditches as you pass."

—The Secret Lives of Fishermen

Enjoy the VIEW

Wherever your travels lead, take along the *North Carolina Wildlife Viewing Guide*. Directions to 90 of the state's best locations for seeing wildlife include maps, observation tips and habitat notes. And if you're interested in a particular species, this guide tells you when and where it's most frequently seen.

NORTH CAROLINA WILDLIFE VIEWING GUIDE
$5.95 ITEM CODE **N6**



Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

left front design

▲ **Largemouth Bass.** Add some history to your fishing trips with our bass tee. This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12XLG** (extra large)
A12LRG (large) **A12XXL** (extra extra large)

left front design

▲ **Snow Geese.** Our waterfowl tee recalls times past, when the Cape Hatteras lighthouse stood close to Diamond Shoals. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front. Celebrate conservation efforts with this white, all-cotton tee.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo. Grab a gobbler with this tan, all-cotton tee.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail their quarry and some that tree as well.
Each poster is 22" x 34".
Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams.
Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

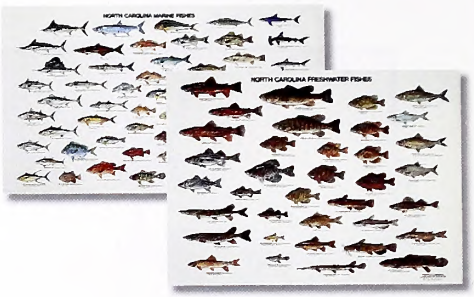
Nature's Ways Collection ▲

If you're looking for drama and science combined, "Nature's Ways" essays from *Wildlife in North Carolina* will deliver. Includes a new comprehensive index to all six volumes so you can find related essays easily.

Half-price while supplies last.

Boxed Set $15 ITEM CODE **M10**

Unboxed Set $13.75 ITEM CODE **M9**



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**

Rivers of North Carolina ◀

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* published in Nov. 1999 chronicles the natural history of 17 major river basins in North Carolina. Travel from the Little Tennessee and the Hiwassee to the Roanoke and the Tar-Pamlico. It's a journey that will last a lifetime.

Half-price while supplies last.

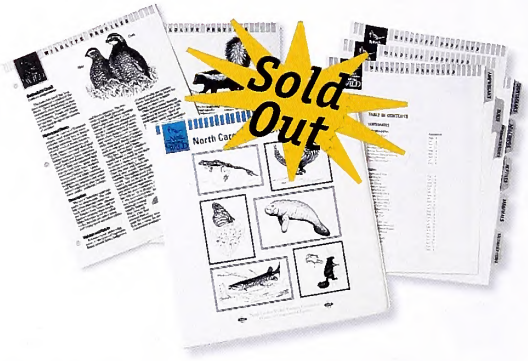
$5 ITEM CODE **M11**

North Carolina WILD Places: A Closer Look ◀

Book and Posters Set.

Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a N.C. WILD Places map featuring the art of Jackie Pittman make this set a valuable teaching tool.

$16 ITEM CODE **E6**



Items not pictured:

All Things Are Connected

Video and Activity Guide. Based on Chief Seattle's 1855 speech, the film's focus is on environmental ethics. Accompanied by *This Land Is Sacred* teacher's guide, this film is a must-see for everyone. $22 ITEM CODE **W3**

Bird Houses and Feeders

This 8-page illustrated guide to building birdhouses includes construction notes and dimensions, as well as tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE **M6**

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE **M2**

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set.

$2 ITEM CODE **M5**

N.C. WILDLIFE Profiles Binder and Profiles Sets 1–12 ▲

This top-quality 3-ring binder includes:

- 120 illustrated fact sheets, each profiling an animal's history, status, habitat and behavior, and also containing a range map.
- Tab dividers that organize 12 sets of wildlife fact sheets by class.
- A table of contents, index and instruction sheet.

Half-price. $15 ITEM CODE **W17**

2002 Migratory Waterfowl Print and Stamp Set ▶

Dawn breaks, and a flock of pintails settles on the brackish waters of Pamlico Point. In the gray light, a father instructs his son to focus on just one bird before shooting. Signed by artist Ron Louque, "Traditions at Pamlico Point" will stir memories of a first hunt for many a waterfowler. Your purchase of this limited-edition set supports wetlands research and restoration. Overall size: 12" x 14"; image size 6 1/2" x 9".

This item not subject to 15% discount.

$145 ITEM CODE **DSP02**

WILDLIFE COMMISSION SPOTLIGHT

HOW TO BECOME A WILDLIFE OFFICER

To become a N.C. Wildlife Resources Commission wildlife officer, you must be a citizen of the United States, at least 21 years of age, have a high school diploma or its equivalent and be of good moral character.

Out of more than 400 applicants, approximately 15 to 20 applicants are selected to attend the basic training school. Applicants become employees of the N.C. Wildlife Resources Commission when they begin the school, where they receive a minimum of 770 hours of instruction during an accredited 19-week basic law enforcement training course.

Graduates of the school are then placed in the field, training under the supervision of a veteran officer for a period of at least six months before receiving a permanent duty assignment. The agency's Division of Enforcement is an equal opportunity employer of more than 200 wildlife enforcement officers, who enforce state and certain federal wildlife laws and regulations. Officers are stationed within one of the state's nine wildlife districts. Their assignments can change, and officers must be willing to accept duty anywhere in the state.

Enforcement responsibilities consist primarily of wildlife law enforcement and involve working many nights, weekends and holidays, often in adverse weather.

During warm months, officers check boating safety equipment, licenses and creel limits. During cold weather, officers may check hunters, investigate illegal baiting activity or work in conjunction with aircraft to apprehend firelighters illegally shooting deer at night.

KEN TAYLOR

KEN TAYLOR

KEN TAYLOR

***While attending** enforcement school, each wildlife officer receives training in marksmanship, defensive tactics and numerous other skills required to perform their duty in the field.*

For more information on becoming a wildlife officer, contact us at:

Division of Wildlife Enforcement
1717 Mail Service Center
Raleigh, NC 27699-1717
(919) 733-7191
Report violations to: 1-800-662-7137

Wild Brown

A young brown trout waits for a meal in a crystal clear stream in the North Carolina mountains. Trout, as well as many other species, are found in our wild streams. See page 24 for more.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

7:67/7

WILDLIFE IN NORTH CAROLINA

JULY 2003 $2.50

States of Grace

by Jim Dean

JIM DEAN

"Surely, I thought, our metaphorical goose is cooked."

Call me pessimistic, but when things go too smoothly, I get anxious. Having spent a good bit of my professional life among wildlife biologists, I have adopted their innate skepticism, along with an admittedly cynical belief that disorder is the natural state of things. There may be a grand plan, a set course, but the needle on life's compass seems to take a lot of wild swings.

Thus, when the forecast for Opening Day of the trout season this past April called for uncharacteristically warm weather, I grew suspicious. When good fortune cleared our schedules so that my son Scott could join my brother John and me for a rare family weekend of fishing, I was nearly certain that disaster lurked. Furthermore, when John announced that he was going to grill a Canada goose for supper the night before we hit the streams, I took that as a sour omen. *Surely*, I thought, *our metaphorical goose is cooked.*

But it turned out that my apprehension was, for once, misplaced. The weather held through the weekend, growing more and more pleasant despite one drizzly morning. Instead of the frigid temperatures, icy rain or spitting snow that has so often accompanied opening weekend, a three-day slice of near-summerlike weather hauled into the northern mountains and pitched camp.

Because the water was high, we hiked into remote headwaters to fish for wild, stream-bred browns and rainbows. As my old friend A.J. Johnson had taught us more than 30 years ago, we fished tandem flies with a small sinking pattern strung a foot or so beneath a dry fly. The trout in these streams are seldom selective. For dry flies, visibility is far more important than the specific pattern. You can't effectively fish a fly you can't see, and a bushy dry fly such as a Wulff or elk-hair caddis in size 14 or larger is easier to see on the turbulent currents. These buoyant dry flies not only catch fish, they also serve as "strike indicators" for the sinking patterns.

Not surprisingly, we caught most of our fish beneath the surface on small bead-head hare's ears and pheasant-tail nymphs. While old standards such as Tellico nymphs and hard-bodied black ants still catch fish, the newer bead-head patterns are even more effective.

We caught and released lots of browns and rainbows up to about 10 inches, including a 12-inch brown John caught and a handsome 13 1/2-inch brown that took Scott's Wulff.

One surprise was the lack of crowds normally encountered on opening weekend. We saw only one other party of fishermen, and they were equally puzzled.

"I suppose some fishermen misjudged the weather," one of them surmised, "but I also suspect that more and more fishermen are going to the Wildlife Commission's popular delayed-harvest streams. Those streams are well-stocked but permit only catch-and-release fishing until later in the season, and they're certainly easier to get to."

That evening, the temperature was so moderate we didn't even need a fire in the wood stove. As we sat on the porch after supper, I told Scott and John about another unseasonably warm Opening Day I remembered in 1978.

Andy Aretakis, Tom Cooper and I had walked into a remote creek, and by midafternoon it was 88 degrees. That seemed especially bizarre because we'd had a horrible winter. We split up and each caught 20 or so nice wild browns, mostly on dry flies.

In late afternoon, sweaty and tired, I headed back downstream to the trail where we were going to walk out. As I came around a bend in the creek, I saw what looked like a pair of pink walruses basking on a rock. Andy and Tom were buck naked, passing a small flask of celebratory refreshment back and forth.

"We'll save you a sip, but first you have to go skinny-dipping," they said. "The water is nice."

I stripped off my clothes, leaped into the pool and immediately leaped back out. My stream thermometer read a chilly 52 degrees.

"Might have cooled off a little," they allowed as I emerged, blue-lipped and shivering.

But, oh, what rare days are those when you would even consider such a dip on the first Saturday in April. And rarest of all, nothing bad happened to Scott, John and me. Our precious window lasted all the way back up the mountain, until we stopped for supper in Boone.

By the time we'd finished eating, the temperature had plunged 30 degrees, and sleet was bouncing off the parking lot as we ran to the car.

Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

July 2003

Volume 67, Number 7

page 18

page 2

Features

2 **Blackbeard Resurfaces** *written by Larry Riddle*
illustrated by Chris Armstrong
An ongoing archaeological study aims to determine whether Beaufort Inlet wreckage is the legendary pirate's ship.

10 **Small Craft Advisory** *written and photographed by Jeff Samsel*
Don't overlook little boats for mountain rivers and lakes.

14 **Oregon Inlet's Questionable Future** *written by Chris Powell*
It remains uncertain if this doorway to the Atlantic can be kept open.

18 **Quiet Restoration** *written by T. Edward Nickens*
photographed by Melissa McGaw
Umstead Park offers a woodsy respite from the hustle and bustle of the Triangle.

24 **Build It, and They Will Come** *written by Joel Arrington*
These underwater junk piles are pure gold.

page 14

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Marianne Wallace* 28
Back Porch *by Greg Jenkins* 32
N.C. WILD Store 37

page 28

Cover *A toadfish finds shelter in a piece of pipe. Photograph by Jim Bunch.*

N.C. DOCUMENTS CLEARINGHOUSE

JUL 0 7 2003

STATE LIBRARY OF NORTH CAROLINA
RALEIGH

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $12, three years $30, lifetime $150. All foreign subscriptions are $28 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.

Blackbeard

RESURFACES

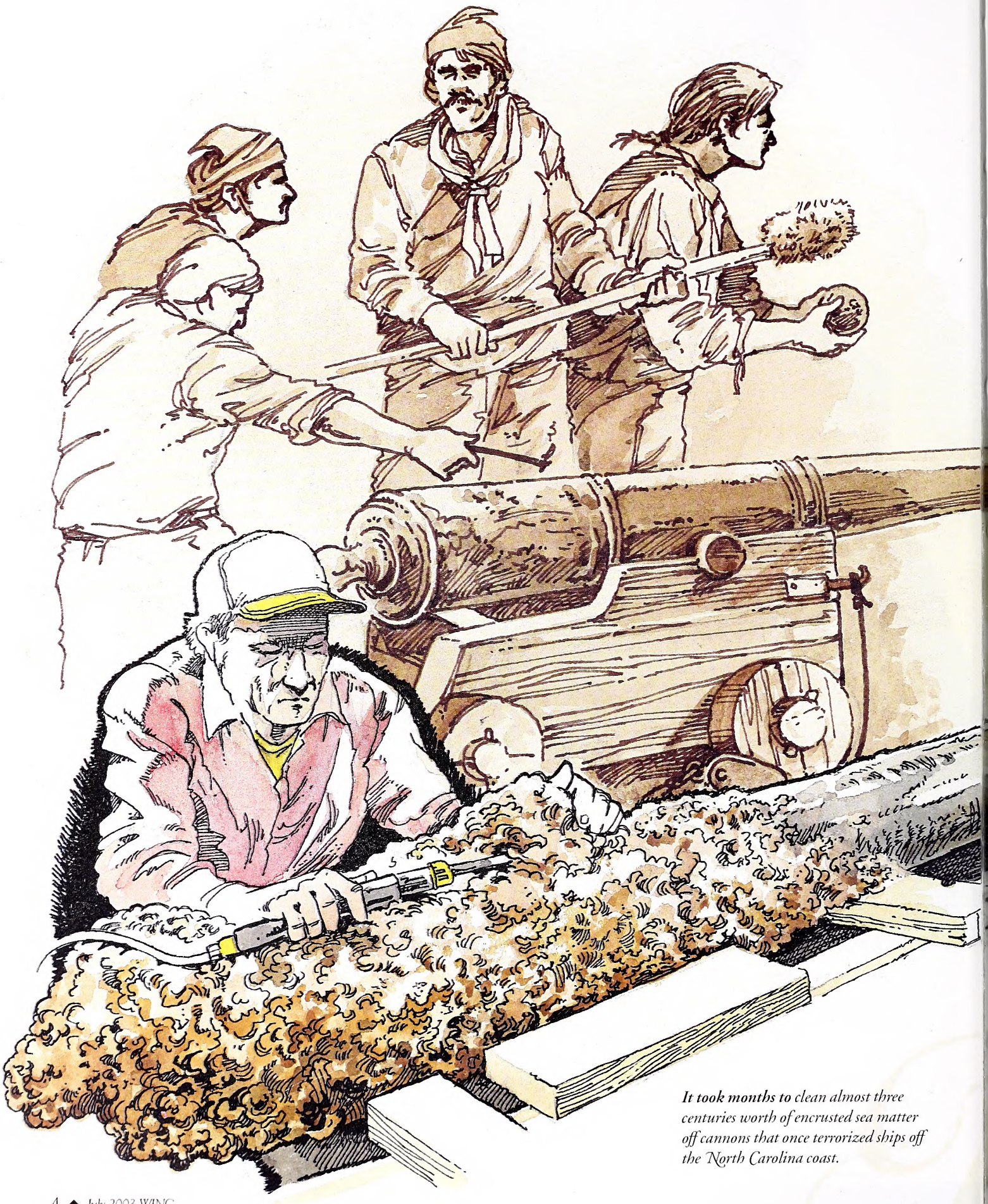
An ongoing archaeological study aims to determine whether Beaufort Inlet wreckage is the legendary pirate's ship.

WRITTEN BY LARRY RIDDLE
ILLUSTRATED BY CHRIS ARMSTRONG

Historians believe Blackbeard intentionally grounded his ship, the Queen Anne's Revenge, *near Beaufort Inlet, taking most of the treasure and leaving much of his crew behind.*

On Oct. 2, 1717, young Louis Arot sailed away on the *Concorde*, a majestic 200-ton vessel loaded with slaves that his superiors had bought in West Africa. Arot was to become a footnote in history, but an important one: He made a decision that led to perhaps the strongest evidence yet that the remains of Blackbeard's most infamous ship lie in 23 feet of water near Beaufort Inlet.

Two months after leaving Africa, the illness-infested *Concorde* was stormed by a crew of seafaring adventurers who demanded to learn what valuables were aboard. Arot—just 15 years old and the lowest-paid crew member—let it be known that the ship's captain and senior officers had gold dust hidden away. After helping the pirates find the gold, the young man chose to join them and remain aboard the ship, rechristened the *Queen Anne's Revenge* by Blackbeard. The vessel was named as much in tribute to the queen who had anointed him a British privateer as a snub to the ruling King George I, who had branded Blackbeard an outcast.



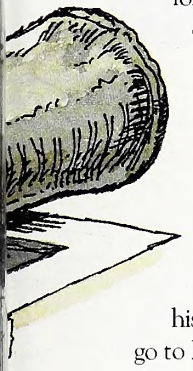
***It took months to** clean almost three centuries worth of encrusted sea matter off cannons that once terrorized ships off the North Carolina coast.*

More than two and a half centuries after Arot's decision, David Moore, a graduate student in maritime history at East Carolina University, took an interest in Blackbeard and the *Queen Anne's Revenge* (*QAR*). Alternating his work between the study of primary source material such as the *Concorde*'s crew roster, first-person depositions and histories—some factual, some extravagantly embellished—and excavation dives, Moore has become, in the words of noted marine archaeologist George Shannon, "the nation's leading authority on Blackbeard and the *QAR*."

It was fortuitous for Moore that a job opened in North Carolina that would put him within hailing distance of the site now believed to be the location of the wreckage of *QAR*; in 1996, he was named nautical archaeologist for the North Carolina Maritime Museum in Beaufort. On Nov. 21 of that year, according to Lindley S. Butler, professor emeritus of history at Rockingham Community College, divers under the direction of treasure hunter Phil Masters "descended on the west side of [Beaufort] inlet and saw in the murky water a large mound of debris heavily concreted with maritime growth. Clearly visible were large anchors and three cannons."

The excitement of the divers was immense. Imagine discovering one of the oldest ships ever uncovered off the North Carolina coast—known as the Graveyard of the Atlantic for the hundreds of vessels that have met their demise in rough waters and treacherous storms. Imagine finding the ship aboard which Blackbeard terrorized the citizens of Charleston, S.C., for at least a week in May 1718 by commandeering the pilot boat and many of the vessels going into and out of the colonial city's harbor.

Blackbeard was the name given to the pirate because of the abundant scruff of hair that prevented a clear view of his face. He was believed to be of English origin, and for years his given name was believed to be Edward Teach. Moore has compiled evidence strongly suggesting that his name was Edward Thatch, with "Teach" emerging perhaps from an erroneous pronunciation. Neophytes to the study of the "golden age of piracy" often are stunned to learn that Blackbeard built his reputation as the most ruthless ocean bandit of all time during a reign of terror that lasted but two years, ending in a fateful showdown with British Lt. Robert Maynard off the coast of Ocracoke Island on Nov. 22, 1718.

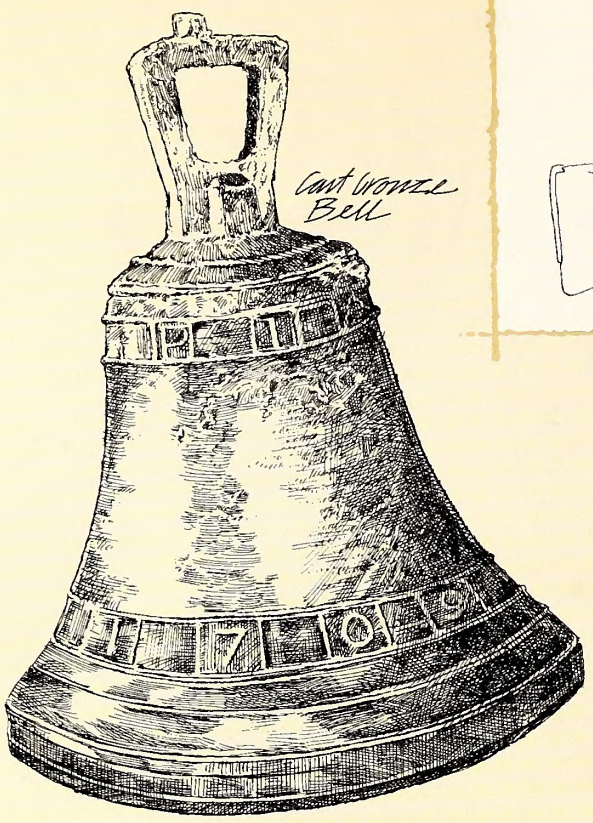


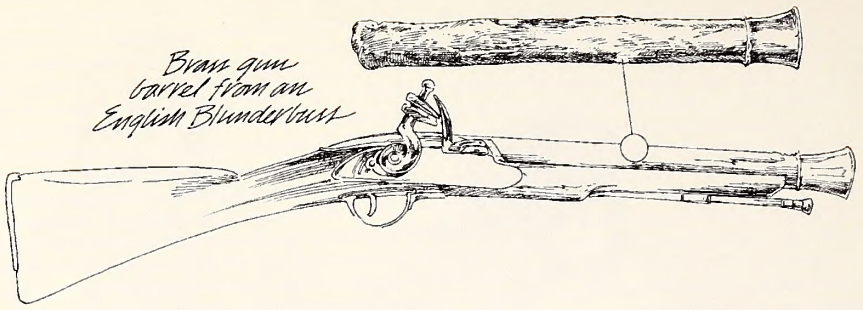
Imagine, then, the discovery of a ship—said to have been armed with as many as 40 cannons—which some historians theorize Blackbeard purposely ran aground. It is believed that he cast ashore many of his crew members so more of the bounty onboard could go to his already impressively stocked hold.

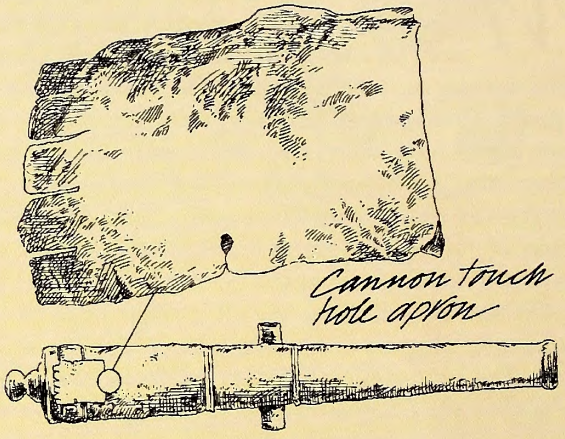
When divers discovered what they thought to be the *QAR*'s remains, wreck diver Mike Daniel traveled from Florida to Beaufort to join the excavation, as did officials from the N.C. Department of Cultural Resources. As divers fought rough waters—coincidentally on Nov. 22, 1996, the anniversary of Thatch's death—several small items were retrieved and brought to the surface. One was a bell. Carefully removing encrustation built up from decades of lying on the ocean floor, the divers found what they had hoped for—a date: 1709. That was the correct time frame, making it plausible that this was, indeed, the *Concorde*/*QAR*. Other items brought to the surface included a brass gun barrel from an English blunderbuss, a 21-pound deep sea sounding weight and lead pieces identified, according to Butler, as parts of "a cannon touch-hole apron, which protected the powder charge from dampness."

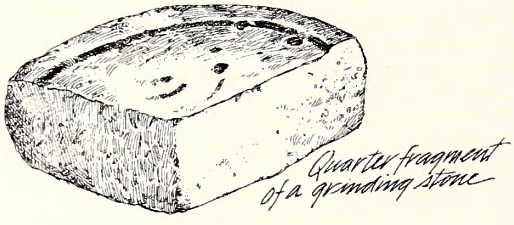
***Divers used balloons** to raise cannons and other artifacts from the ship scientists believe is Blackbeard's.*

The excitement of the divers was immense. Imagine discovering one of the oldest ships ever uncovered off the North Carolina coast.

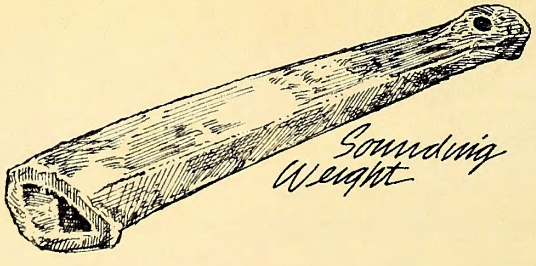


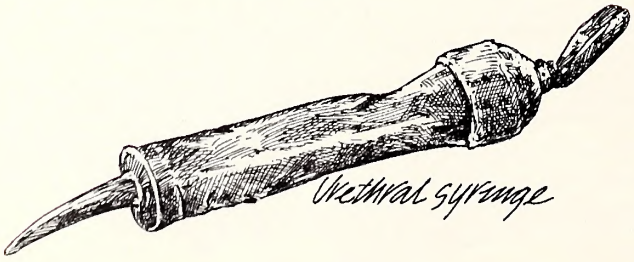


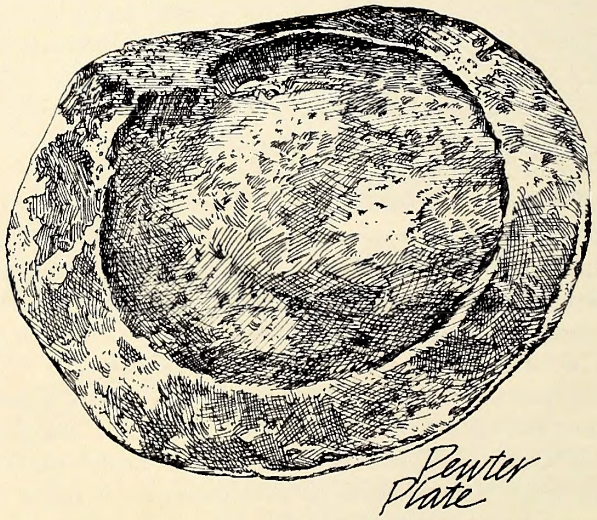




***The large number of** 18th-century artifacts recovered from the Beaufort Inlet wreck made researchers almost certain the ship was the legendary* Queen Anne's Revenge.







"It looks as if the Graveyard of the Atlantic has yielded one of the most exciting and historically significant discoveries ever located on our coast."

Months were spent cleaning and preparing the finds for exhibition. On March 3, 1997, Gov. James B. Hunt Jr. declared, "It looks as if the Graveyard of the Atlantic has yielded one of the most exciting and historically significant discoveries ever located on our coast." Jeffrey J. Crow, the director of the state Division of Archives and History, said, "This is the most important underwater archaeology discovery since the USS *Monitor* was found off Cape Hatteras in 1973." The field of wreckage is so historically significant, it was designated a protected site for historic and scientific research.

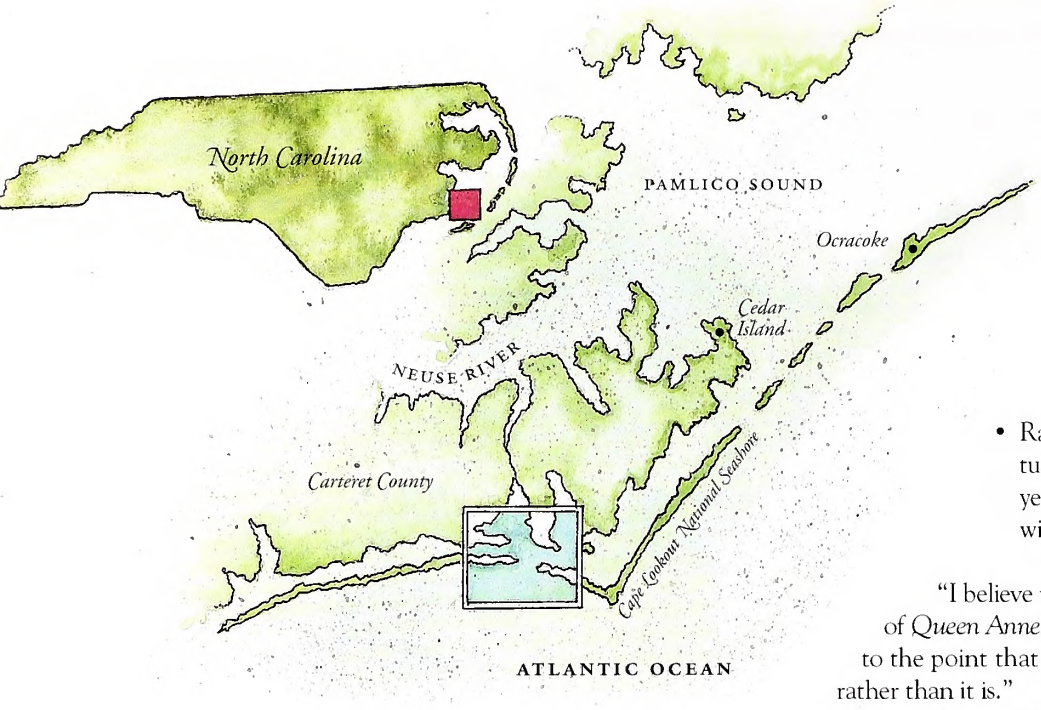
But many questions remained, and despite the hope of archaeologists and historians that they had found the wreckage of the most renowned pirate ship in history, even they were not convinced. The bell, after all, was not inscribed with the name *Concorde*, as they would have hoped. The inscription "IHS MARIA" identified it as Spanish in origin—not even a ship's bell, but perhaps pirate's bounty from a church. More dives were needed.

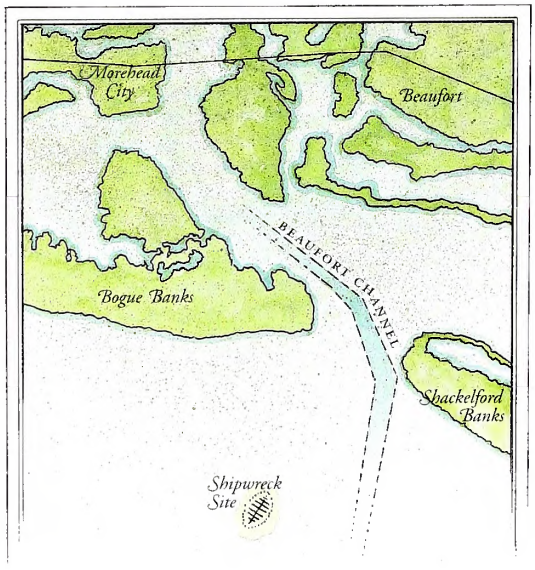
A subsequent excavation in 1997 yielded an impressive array of artifacts, including ship's rigging, large amounts of 18th-century glass and pewter ware, many musket balls, three large anchors and 15 cannons. Two of the cannons were raised, and Crow announced researchers were "95 percent certain" that the wreckage was the *Queen Anne's Revenge*. Moore believed the wreckage was the *QAR*, but he knew that additional evidence would be needed to convince others. A 1998 dive produced a urethral syringe used to treat syphilis, a well-preserved anchor and a minuscule amount of gold dust.

Thanks to the young cabin boy Louis Arot, historians knew that gold dust was aboard the *Concorde*. And, for David Moore, the gold dust found during the 1998 dive—a meager amount, some specks as small as a grain of sand—was convincing evidence that Edward Thatch's most famous vessel had been found. "The gold dust put it over the edge for me," Moore said. "We know the *Concorde* had gold dust on it when it was captured." He theorizes that as the pirates were confiscating the gold, small amounts fell to the floor and then through cracks to be entombed, along with the ship's wreckage, for 280 years.

"It's just something pirates would not purposely leave behind," Moore said of the gold dust. He points to other factors to support his belief that *Queen Anne's Revenge* has been found, including the following:

- The dating of the Spanish bell to 1709 and the dating of a cannon to 1713 fit with the *Concorde's* known period of operation of 1713–1717.
- The location fits. After marauding along the coast at Charleston, S.C., Blackbeard is known to have sailed toward what is now Beaufort Inlet, and it was on a sandbar near the inlet that *QAR* ran aground.
- The size of the cannons and anchors were appropriate for a vessel as large as *Queen Anne's Revenge*.





- Radiocarbon dating of the ship's hull structure confirms that it was built between the years 1690 and 1710, which would have been within the dates the *Concorde* was built.

"I believe wholeheartedly that the wreckage is that of *Queen Anne's Revenge*," said Moore. "We've gotten to the point that the effort is stronger to prove it isn't, rather than it is."

The evidence is significant that the state of North Carolina can lay claim to the largest and most well-armed vessel ever piloted by history's most infamous pirate. All of the items uncovered so far predate 1718, the year the ship is known to have gone down, but still missing is what Moore refers to as the "smoking blunderbuss," be it a ship's bell fashioned specifically for the *Concorde* or the wreckage of the *Adventure*, another ship known to have gone to a watery grave at the same time and near the *Queen Anne's Revenge*.

But the search for that evidence has been stalled. Unlike dives to the Civil War ironclad the USS *Monitor*, whose resurrection from the depths has been accomplished largely because of generous government funding and support, dives to the *QAR* site have come to a virtual halt because of state government budget cutbacks. Ultimately, the state of North Carolina hopes to prove conclusively that the wreckage is that of *QAR*, and to develop one of the nation's premier nautical attractions from the artifacts. Already, the N.C. Maritime Museum in Beaufort offers an exhibit of items that have been found, and a traveling display of other findings is touring the state. Plans call for a multimillion-dollar *QAR* repository and Blackbeard exhibition to open in the future.

Moore estimates that only about 5 percent of the wreckage has been excavated; due to the dire financial straits in which the state now finds itself, further recovery efforts probably will be delayed indefinitely. Butler writes, "This is a long-term project that may take a generation to complete, will probably cost tens of millions of dollars and will recover possibly a quarter of a million artifacts." For now, though, the wreckage lies, awaiting further excavations, secured by an electronic surveillance system but still exposed to the vagaries of changing weather and shifting seas. Butler writes, "After five years of archaeological research, the over 2,000 recovered and conserved artifacts offer a compelling circumstantial case that this wreck is likely *Queen Anne's Revenge*. But in reality this project has just begun, and in effect the archaeological surface has barely been scratched."

Christopher Martens, William B. Aycock Professor of Marine Sciences at the University of North Carolina at Chapel Hill, said the findings so far are consistent with when the *Concorde*/*Queen Anne's Revenge* was built. But, he asks, "Does this prove without a doubt that it's the *Queen Anne's Revenge*? No, but the state's underwater archaeologists are finding so many physical pieces of evidence that, taken in their entirety, we're building a strong scientific case that this likely was Blackbeard's ship." Thanks, in part, to an underpaid and underappreciated 15-year-old cabin boy named Louis Arot. ⊠

"This is a long-term project that may take a generation to complete, will probably cost tens of millions of dollars, and will recover possibly a quarter of a million artifacts."

SMALL CRAFT ADVISORY

DON'T OVERLOOK LITTLE BOATS FOR MOUNTAIN RIVERS AND LAKES.

WRITTEN AND PHOTOGRAPHED BY JEFF SAMSEL

Barely waiting for the canoe to bump gravel, my buddy leapt out. With one strong tug, he grounded the boat, not wanting to leave me with all the work, I suppose. Then he raced to the base of the shoal. By the time I got out and scurried down the edge of the shoal, he was grinning like a kid on the last day of school as he did battle with a feisty smallmouth in the swift current.

I waded in beside my friend and cast a grub across the deep, rocky run he had just pulled his fish from. Soon, I too was hooked up and sporting a similar grin. We would fish the entire shoal by wading, casting to every eddy and seam that the rocks and the current combined to create. Then we would relaunch the canoe and continue downstream, making scattered casts as we went but looking toward the next shoal.

My canoe served mostly as a taxi that day, shuttling us to several fish-filled shoals that were spread along 5 miles of river. But on other days, the same craft has served as a fishing boat for exploring remote mountain lakes or float-fishing Piedmont rivers.

Modern bass boats, with rod lockers designed to carry a closetful of gear and big outboards that hurry fishermen from point to point, offer tremendous usefulness for many fishing applications. Likewise, pontoons, deep V's and various other kinds of craft have their places. Not to be overlooked among watercraft, however, are those boats that can be tossed on top of a car or into the bed of a pickup truck and slid into the water, even without the luxury of a ramp.

Car-toppers, small and unassuming, offer an undeniably romantic appeal, as do many of the waters they are most often used to explore. More important, though, these kinds of boats offer practical advantages. They come at a low cost, and you need neither a trailer nor a high-torque truck to tote one to the lake. Above all, they take you to places where you simply cannot go with other kinds of boats.

Many of the rivers and lakes I like best for fishing with a car-top boat don't have paved boat ramps. Meanwhile, most of the best shoals to wade on North Carolina's larger smallmouth rivers are not accessible from the banks. They are either surrounded by deep water or flanked by private lands, so the only way to get to them is by canoe or kayak.

Car-toppers include all kinds of watercraft that can be transported with no trailer, whether flipped and tied to the top of a car or slipped into a pickup. Float tubes—also known as belly boats—fit the bill by my definition, and you may not even have to tie a tube to the top of your car. A float tube fits neatly in the back of my station wagon, and

YAMAHA

Canoes are ideal for fishing larger bodies of water and have plenty of room for gear and another angler. Float tubes, on the other hand, are more suited for small ponds.

you can get a couple of tubes in a normal car trunk by partially deflating the air chambers.

Car-top boats come in an array of styles, each with its strengths and weaknesses. Beyond belly boats and canoes, major car-top categories include johnboats, kayaks and various designs of hard-plastic miniature fishing boats.

TYPES OF TOPPERS

If you want to slip out on a summer afternoon to cast crickets under corks toward the banks of a secluded high-country lake, you'll find nothing more enjoyable than sitting waist deep in the seat of a belly boat. You can also take a belly boat almost anywhere. Stick your gear in the pockets, grab a loop and toss the tube over your shoulder, and it's no big deal to tote it a few hundred yards to access remote waterways.

Float tubes rely on leg power, whether it is walking the bottom of a shallow stream or kicking fin-clad feet to propel you. Therefore, tubes lend themselves best to fishing small waters, where there's no need to run from spot to spot. Tubes also leave you pretty low in the water, so you probably should stay away from waters with significant boating activity.

Canoes and kayaks are typically propelled by paddle, utilizing efficient hull designs to maximize mobility. Kayaks will get you around quickly without a lot of effort, but cramped quarters put obvious limitations on comfort and gear capacity. Canoes, likewise, limit the stuff you can carry, but to a much lesser degree. You have room for a couple of rods and a bag stuffed with fishing gear and a sandwich or two.

General recreational canoes offer the most versatility as fishing boats. Most are made to handle small whitewater, but they also track nicely and offer decent stability for lake fishing. Plus, they are modest in cost, unlike specialized whitewater or touring boats. I have a 15-foot canoe, which is fairly short by canoe standards, but it allows plenty of space for two people and doesn't hang terribly far off the front or back of a car.

Johnboats and other small fishing boats open up a lot of possibilities for fishing with a bit more gear and in more open water. I spend a lot of time fishing from a Coleman Crawdad, which is essentially a heavy-gauge plastic johnboat. With a 4-horsepower outboard on the back and a trolling motor on the front, I can cover all the water I want to in a day. It rides as nicely as a canoe atop a car and is very stable to fish from.

Most johnboat manufacturers make one or two 10- to 12-footers that are light

enough to toss on a car. Other small boats that fit this general class are the flat foam-filled plastic boats, which have raised fishing seats and sometimes come wired for a trolling motor or otherwise rigged for fishing.

Johnboats and their kin offer space and stability, more so than other car-toppers. You can bring an extra rod or two if you want, and even some extra toys such as coolers, bait buckets and portable electronics. Stability comes in handy with bouncy kids in the boat and at times when winds or other boaters make the water a bit choppy.

But what these boats lack is the go-anywhere quality that makes canoes really shine. As much as I enjoy fishing from my Crawdad, I won't lug it too far down a hillside to launch it, especially with a motor and a battery. And it definitely wasn't designed to be propelled by paddle or maneuvered down a mountain river.

If you plan to tote a boat atop a car, you want to stick with something that weighs less than 100 pounds or so. For truck-bed hauling, where you won't have to lift over your shoulders, you can go a bit heavier—but not too much heavier. Also, be sure to consider the width of any boat you're thinking about buying compared to the width of your car roof or truck bed.

The best style of car-top craft for you really depends on where you want to take it and how you want to fish with it. Of course, that's where the price tag for a small boat really comes into the equation. A float tube costs less than half of what just the prop for a larger fishing boat's motor would run, so buying a belly boat in addition to a canoe or car-top johnboat might not be out of the question.

RIGGING UP

Float tubes call for fewer extras than other kinds of craft. In fact, for warm-weather fishing in shallow water, all you really need in addition to the tube itself is a life jacket. If you need to deflate your tube significantly to transport it, a hand pump comes in handy. For most lake fishing, you'll also need a pair of fins that strap onto your feet. Depending on air and water temperatures, you might also want a pair of waders.

For canoes and kayaks, add paddles, a life vest for each person, a throwable flotation device and some sort of tie-down system. For truck-bed hauling, a rope and a flag for the end of the canoe will do the job. Car-top carrying calls for more padding and ropes. Commercially made kits designed for carrying boats on cars make things simple and secure.

Other stuff you'll probably want in your canoe includes some form of bailing device, a rope to tie off with and a light anchor. Makeshift items, such as half a plastic drink bottle for bailing or a window weight for an anchor, work fine. Some fishermen also rig canoes with electric motors or very small outboards, using special adapters for motor mounting.

For anything wider than a canoe, some type of motor borders on being necessary. An electric motor with 30 or 40 pounds of thrust will pull most car-toppers around just fine. "Pull," incidentally, is a key word in trolling motor talk. It is far easier to control a small boat with a front-mounted trolling motor than with a back-mounted motor.

Adding a gas motor to your car-top rig gives you the capability to cover a lot more water. Beyond getting you across the lake in shorter order, a small outboard will go a lot farther on even a modest amount of gas than will an electric motor on one battery charge. I use my outboard to move from spot to spot, but turn to the trolling motor for fishing.

If you go with a gas motor, consider size and weight when you pick one. Keep in mind that with car-top transport, you'll be carrying the motor down to the water, mounting it at water's edge and reversing the process every time you use the motor

Also, check the size of the motor's built-in tank. A 1-gallon built-in tank will run a small outboard for a long time. Any smaller and you'll need to get an accessory gas tank and hose, which isn't a big deal, but it is one more thing to put in the car and carry down to the water.

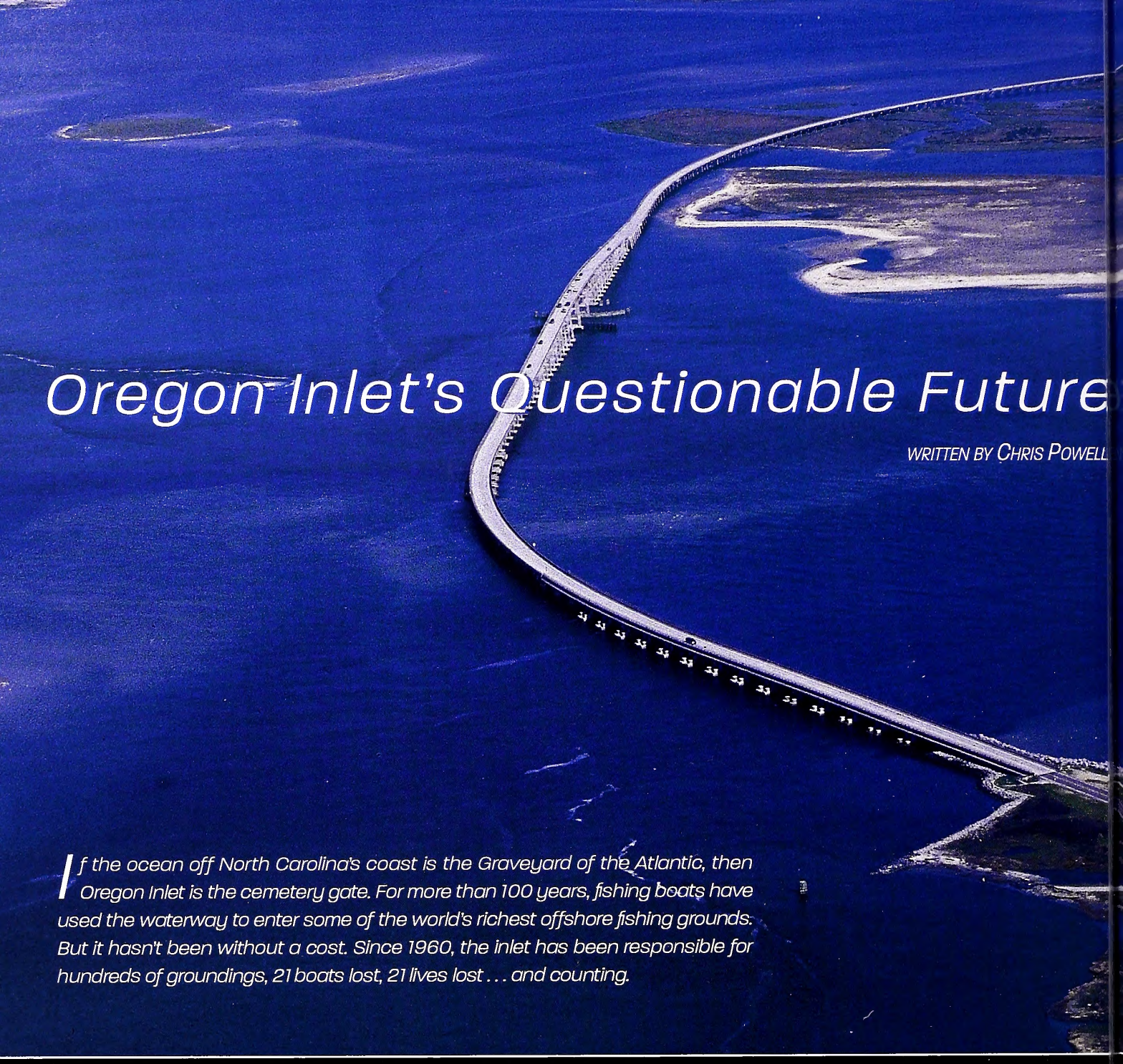
Whether you opt for an electric motor, a gas motor or both, don't forget to stick a paddle in the boat. Assuming the worst won't happen is certain to leave you up the proverbial creek at some point. A paddle also comes in handy for pushing off the bank or out of the shallows after you pull a fly from an overhanging hemlock.

A final thing worth noting is that any motorized vessel, no matter how small, must be registered. Be sure to add boat numbers to your accessories list before you head to the lake. Also, be sure you have your life preservers and that you know the "rules of the road" for safe boating. ⊠

One of the best no-trailer fishing boats is the aluminum johnboat. It can be placed in the bed of a pickup or on the roof, and offers plenty of stability when handling fish over the side.

F. EUGENE HESTER

F. EUGENE HESTER



Oregon Inlet's Questionable Future

WRITTEN BY CHRIS POWELL

If the ocean off North Carolina's coast is the Graveyard of the Atlantic, then Oregon Inlet is the cemetery gate. For more than 100 years, fishing boats have used the waterway to enter some of the world's richest offshore fishing grounds. But it hasn't been without a cost. Since 1960, the inlet has been responsible for hundreds of groundings, 21 boats lost, 21 lives lost . . . and counting.

In recent years, the number of foundering boats has increased noticeably due to strong striper runs that lure anglers into the inlet during fall and winter—more dangerous times of the year. Master Chief Steve Billman, officer in charge of the U.S. Coast Guard Station at Oregon Inlet, said that during a two-month period this past striper season, five boats capsized.

"We have some shifting sands," he said. "This whole area is notorious for shifting shoals. It never remains constant; it is always changing. It doesn't take much wind to build the swell up in the inlet. We get quite a current on both the flood and the ebb. It can really make it difficult for making way. You may have it running out of the inlet at two or three knots."

An effort has been under way since 1970 to stabilize Oregon Inlet by building permanent rock jetties that would provide safer passage for recreational and commercial fishing vessels. That plan recently suffered a debilitating defeat when the White House Council on Environmental Quality (CEQ), the U.S. Army Corps of Engineers, the Department of the Interior and the Department of Commerce all agreed not to proceed with the jetty project.

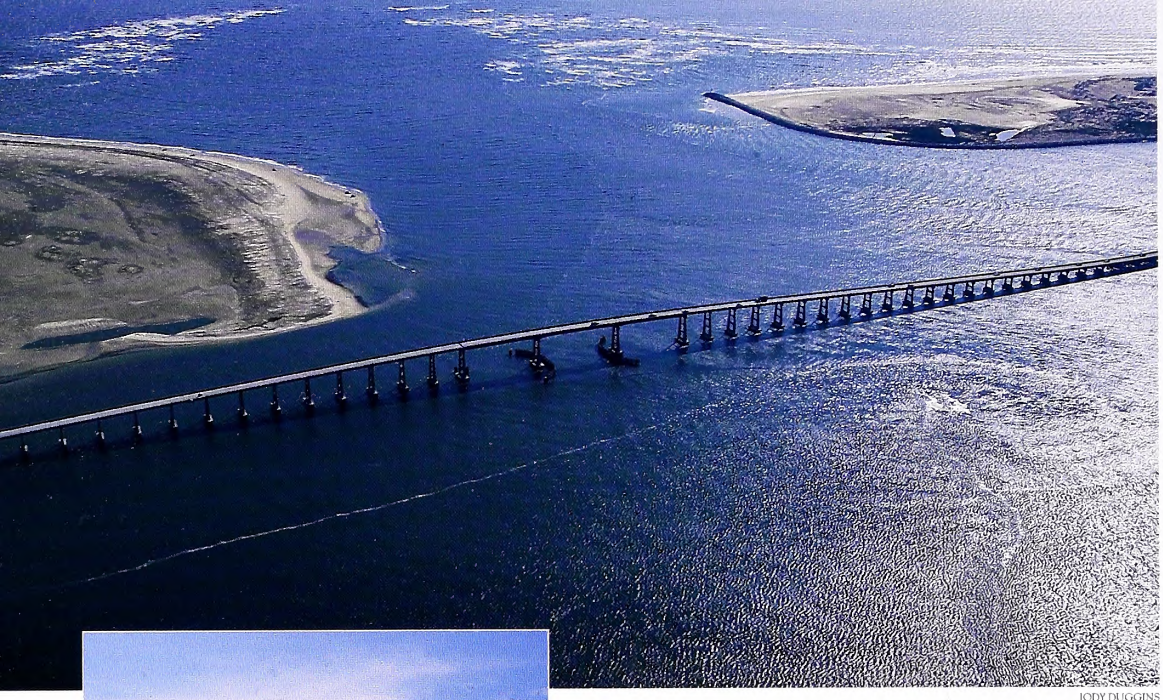
"This decision resolves a long-standing debate among federal agencies with different congressional mandates," said James Connaughton, chairman of the CEQ. "Working with the corps and the other agencies, we looked closely at the economic and environmental data and jointly determined that the uncertainties in projecting both the estimated economic and environmental effects, and the risk to important resources, weigh against proceeding with the project."

JODY DUGGINS

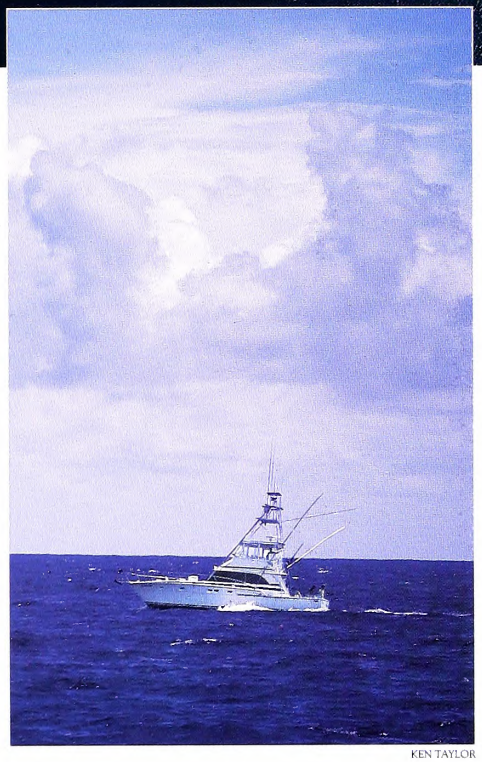
***The beauty of** Oregon Inlet belies its potential for fury during rough weather.*

The announcement from the CEQ put to rest, at least for now, the jetty issue, which had been stuck in political limbo for years. North Carolina repeatedly attempted to get the Department of the Interior to grant a special-use permit to the Army Corps of Engineers to build the jetties. Those attempts were consistently rebuffed. The National Park Service, which owns the north side of the inlet, and the U.S. Fish and Wildlife Service, which owns the south side, both believed that the construction and presence of the jetty would harm vital wildlife habitat. The inlet presently runs through the Cape Hatteras National Seashore, with the Pea Island National Wildlife Refuge to the inlet's south.

The jetty project had called for Oregon Inlet to be stabilized with the help of two massive structures extending out from each side of the inlet. These boulder walls would have included a 10,020-foot north



JODY DUGGINS



KEN TAYLOR

Charter, *commercial-fishing and recreational boats are all dependent on safe passage through Oregon Inlet (top).*

section and a 6,570-foot south section, spaced 3,000 feet apart. Each section would have extended 4,000 feet onto the shore, but under the sand, to serve as an anchor point.

Because sand migrates from north to south, the northern section of the jetty would have included a lower section of wall (called a weir) near the shoreline. The weir was designed to allow sand and larval fish to pass through. The sand would wash over the lower section of the jetty and collect in a deposition area—a dredged hole next to the north side of the inlet. From there the sand would have been sucked up by a dredge and pumped over to Pea Island, just south of the jetty. The cost of the project was projected to be $91 million, and the jetties would have taken four years to build.

The U.S. Army Corps of Engineers has consistently maintained that the only way to truly stabilize the notoriously shifty inlet is by constructing jetties. However, Penny Schmitt, chief of public affairs for the corps' Wilmington district, said, "The Wilmington District supports the decision on the proposed Oregon Inlet jetty project. We will continue to work with the federal agencies, the state of North Carolina and the local community to resolve the difficult issues surrounding Oregon Inlet. As we have for many years, we will continue to survey and dredge the existing 14-foot depth Oregon Inlet navigation channel to the best of our ability, and to work with the U.S. Coast Guard and National Oceanographic and Atmospheric Administration to implement further state-of-the-art techniques as they become available."

The undoing of the proposed project was due primarily to two factors: the enormous cost and the environmental concerns. Even with the jetties, dredging would still be needed to keep the inlet clear, which would be an ongoing expense. Add to that the perception by some that the inlet would have benefited only a handful of commercial fishing operations.

But the fatal blow came at the federal level. The plan repeatedly met stiff opposition from federal agencies that own land on either side of the inlet. Nonprofit environmental groups opposed it as well, fearing that the proposed stabilization project would destroy vital wildlife habitat, including fisheries and recreational areas.

"We are very pleased," said Vic D'Amato, conservation chair of the N.C. chapter of the Sierra Club. "We had serious concerns about the project both from the habitat perspective as well as the survival of the barrier island ecosystem. It was good to see that, in some part, that was recognized."

But even with the CEQ's ruling, Dare County officials are vowing to push to keep the inlet dredged and open to boat traffic. Bob Peele, coordinator of the Oregon Inlet Stabilization Project, said that the main concern now is obtaining sufficient funding to maintain the inlet's navigability. "I question whether the inlet can be kept open by dredging only," he said. "The corps has been able to keep the inlet down to its 14-foot depth only 25 percent of the time. And I don't know if they can keep it open because we have such a large land mass right now on the edge of the channel. However, I am pleased for two reasons. The CEQ didn't just start another study, and they obviously recognize that the inlet is not safe and that something needs to be done."

But with dredging the only option, how much longer does the inlet have? Created in 1846 by a massive hurricane, the inlet quickly earned a reputation as the most dangerous maritime passageway on the East Coast. The inlet naturally migrates south and has traveled 2 miles since it was first formed. In 1990, the inlet's migration began to eat into the land beneath the south end of the Herbert C. Bonner Bridge, which threatened to sever the main link to Hatteras Island. To protect the bridge, a terminal groin (a wall of large rocks) was put in place to halt the movement of the south side of the inlet. But the north side of the inlet, which wasn't permitted to be anchored, continues to move south, despite

annual dredging of 2 million cubic yards of sand. This has created a situation in which the inlet tends to fill up with sand and become more shallow, called shoaling. Also, the encroaching north side has unnaturally narrowed the inlet, which pressurizes the outgoing tide much like water shooting through a water hose nozzle. When the force of water leaving the inlet runs into oncoming swells rolling over shoals, the waves jack up suddenly and violently. These walls of water can break over and swamp outgoing vessels, or catch incoming vessels from behind and drive them down and over.

Gilbert "Moon" Tillett, retired waterman and chairman of the Oregon Inlet Waterways Commission, said he spent a lifetime traversing the inlet. Though he never had a mishap, he did have some very close calls. "Sometimes you get down the beach a little ways, and the wind switches, and the sea builds up before you can get back through the inlet," he said. "And if the sea builds up, you're pretty much at the point where you have got to come through. And what we do is we catch it and kind of surf it, you know. It ain't fun sometimes, and we've done it at night. And we're just lucky, but several [boats] have gone away. It happens every once in a while."

Peele fears that if the inlet becomes impassable, the few commercial vessels left in Dare County will be forced to other ports. "The Wanchese Seafood Industrial Park only has two commercial fishing operations in it," said Peele, who also doubles as the industrial park's manager. "The commercial fishing business would hurt if the inlet closes up, but they will also hurt if it just shoals up. If it shoaled up to just 4 or 5 feet, most commercial vessels couldn't get out at that point."

Dare County officials also worry that if the inlet closes, water quality in the sounds could be degraded. Many millions of tourism dollars will be lost each year if recreational boaters travel elsewhere. And there is also concern that if the inlet does close, the force of water being held back in the Pamlico and Albemarle sounds will break through the barrier islands in a different location, severing costly infrastructure.

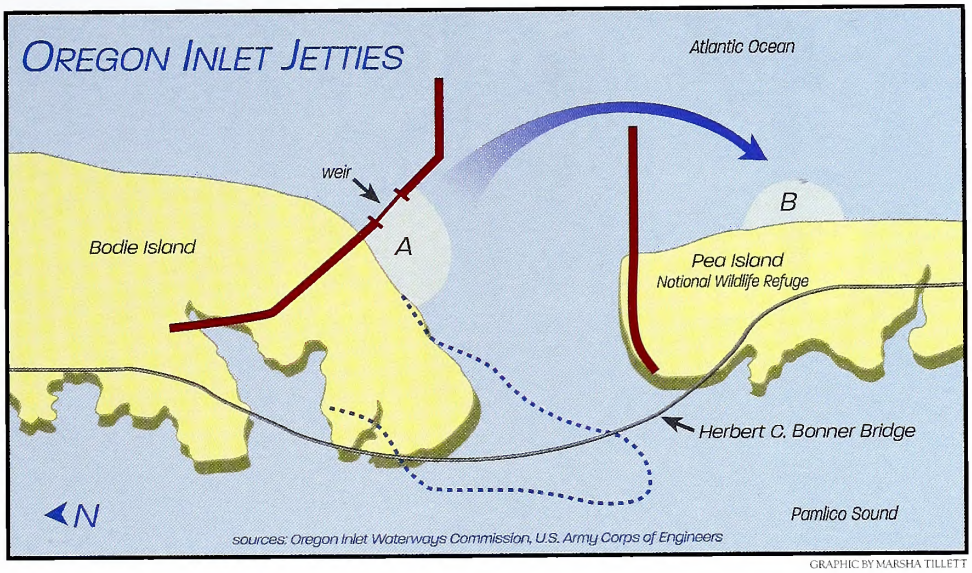
The present dredging regimen is only enough to slow down the encroaching Bodie Island. Coastal engineer Bill Dennis, with the Corps of Engineers, said that between $4 million and $5 million has been spent each year for the past 17 years, and the 14-foot-deep, 400-foot-wide project depth has been achieved only 15 to 20 percent of the time.

The inlet, if not stabilized, will definitely constrict. Corps experts now believe that the inlet, if kept as is, will not close completely. Instead it will bend inside and around Pea Island, making the passageway more north-south than east-west. If this takes place, smaller boats may still be able to use the inlet, but larger boats would not fit beneath the lower portion of the Bonner Bridge.

But that may not be an issue because the bridge is due for replacement. The new bridge is slated to tie in to Hatteras Island much farther south than the existing one and will feature a wider navigation span. The U.S. Fish and Wildlife Service has stated that when the new bridge is constructed, the existing terminal groin will have to be removed because it was installed only to anchor the south end of the current bridge. "If the terminal groin was magically pulled out," Dennis said, "I think you would find a very rapid loss of the tip of Pea Island initially. Once the constraint is pulled off, the inlet would spring back. Eventually, I think it would get back to another longer-term migration."

So for the time being, it appears that the inlet will neither close nor become any safer to navigate. And Oregon Inlet will undoubtedly retain its title as the most dangerous passageway on the East Coast. ⊠

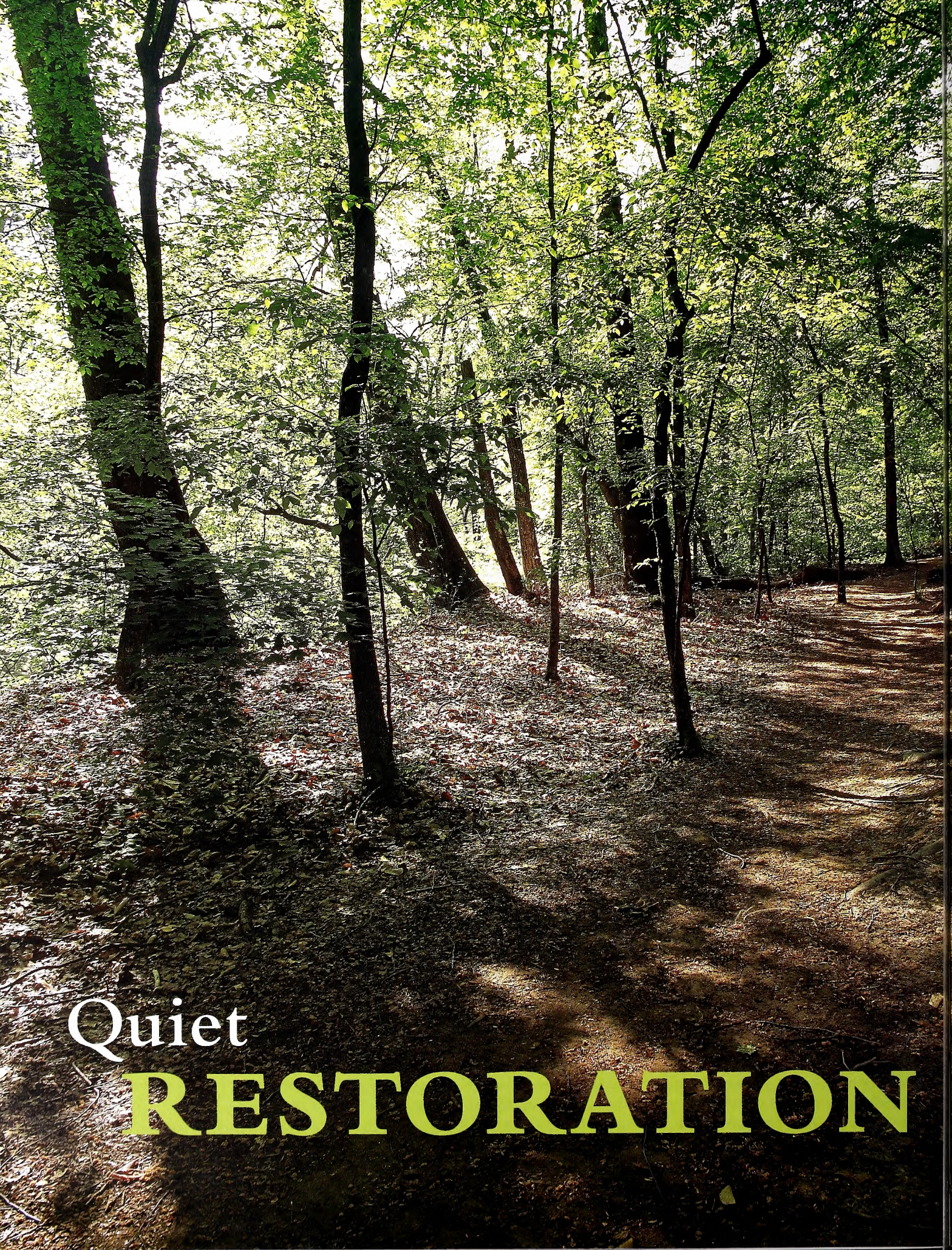
Have any comments on this story? E-mail Chris Powell at chris.powell@ncwildlife.org.



GRAPHIC BY MARSHA TILLETT

The proposed jetty project *was designed to allow southward-migrating sand to pass through the wall and collect in a deposition area (A). A dredge would then collect the sand and deposit it off Pea Island (B). Without the jetties, the U.S. Army Corps of Engineers predicts Bodie Island will migrate south and inside of Pea Island, as shown by the dotted lines.*

KEN TAYLOR


Quiet
RESTORATION

WILD PLACES

Umstead Park offers a woodsy respite from the hustle and bustle of the Triangle.

WRITTEN BY T. EDWARD NICKENS
PHOTOGRAPHED BY MELISSA MCGAW

MY VERY FIRST OVERNIGHT camping trip took place at William B. Umstead State Park, the 5,439-acre jewel of Piedmont hardwoods that lies squarely in the midst of the Research Triangle. With my parents and brother, I roamed the shores of Big Lake and took a hike along Sal's Branch Trail. We roasted marshmallows and all piled into a cavernous Sears canvas tent. All this I've been told—I was 6 years old, and I don't remember a single aspect of the adventure.

But in the last 20 years, my visits to the so-called "Central Park of the Triangle" have been among my most memorable outdoor excursions. I recall hiking under throngs of cedar waxwings trooping through the oaks. In the fall my children tromp off-trail to build leaf forts, and I pack in a day's worth of entertainment to sheltered ridges: Tonka toys and Groovy Girl dolls, magnifying glasses and field guides. In the spring I monitor a couple of low, wet swales where spotted salamanders congregate to breed, and wood frogs and spring peepers sing in a clamor loud enough to hurt your ears.

Curiously, the land that now draws thousands of urban-weary visitors was set aside only because of its seeming worthlessness.

Granted, these are subtle, understated experiences; I can't recall ever having an adrenaline rush at Umstead State Park. But that's the beauty of the place. There's no single significant feature to draw your attention—or draw crowds. Instead, there are countless little hardwood coves where the autumn leaves pour down in multicolored blizzards. There are mallards feeding in backwater sloughs, deer snorting displeasure at their naps being disrupted, and an endless supply of sequestered hideaways—marshy seeps and mountain laurel thickets and groves of big oaks that mark bygone farmhouses—that simply beg for a few hours of dawdling.

Curiously, the land that now draws thousands of urban-weary visitors was set aside only because of its seeming worthlessness. Heavily farmed throughout the 19th century and especially after the Civil War, the rolling hills just west of Raleigh were worn out, eroded and stripped of their good timber by the time of the Great Depression. Water-powered mills lay abandoned. Many farmers were in dire straits. More than half were delinquent on their taxes, and many faced foreclosure. In 1934, the National Park Service launched an effort to relocate Crabtree Creek-area farmers and restore overfarmed land. Through the Resettlement Administration, one of President Franklin D. Roosevelt's New Deal programs, some 6,000 acres were targeted as the Crabtree Creek Recreational Demonstration Area. (The park was originally planned to encompass 22,000 acres, taking in all the headwaters of Richland, Crabtree and Reedy creeks, but funding constraints whittled down its scope. After all, the land was selling for more than $11 an acre.) Farmers were moved to lands outside the project area.

Before long, Civilian Conservation Corps workers were laying out foot trails, building campgrounds and dams, and planting trees. At the advent of World War II the federal government sold the project to the state for a single dollar, and the old Crabtree Creek State Park was established. In 1950, a little more than 1,200 acres of the park in the Reedy Creek section was split off as a separate state park for African-Americans. The two parks were rejoined in 1966.

Restore the Land, Restore the Wildlife

Today, Umstead State Park is lauded as a place where natural succession has healed, and continues to heal, a scarred land. The park is a patchwork of pinewoods, oak groves and even a 50-acre stand of huge, gnarly beech trees that somehow missed the loggers' saws; the Piedmont Beech Natural Area is now posted on the National Registry of Natural Landmarks. Wildflowers carpet the understory, especially in the wide bottoms that lie alongside Crabtree and Sycamore creeks. Along the north-facing bluffs that tower over streams, mountain laurel and rhododendron bloom, well east of their typical habitats. Three lakes stipple the big woods: Big Lake on Sycamore Creek, easily accessed by a wide gravel path; Sycamore Lake; and Reedy Creek Lake. Although not a natural feature, a large power line right-of-way does cut across the park, giving bird watchers an excellent place to scour for grassland species such as indigo buntings and sparrows.

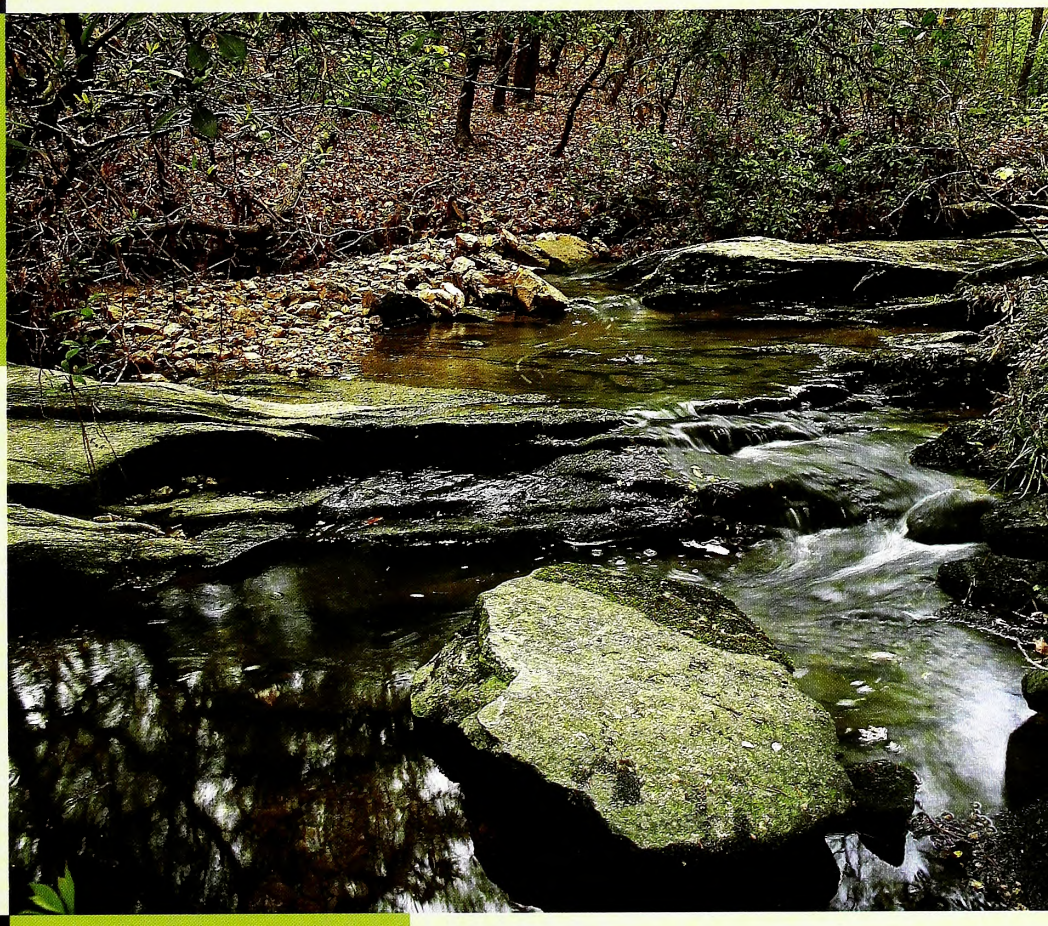
In fact, the patchy mosaic of Umstead's regenerating forests supports a wealth of wildlife. Somewhat habituated to humans, deer, ducks and beavers at Umstead are particularly easy to view, and gray squirrels are everywhere. Fred Barkalow, a revered N.C. State University professor, studied Umstead's gray squirrels for years, work that resulted in one of the seminal texts on the natural history of the animals, the 1973 book *The World of the Gray Squirrel.* Wild turkeys have long been established at Umstead, and some 50 bird species are known to nest in the park. Given its size and heavy cover, the park is also a trove of reptiles and amphibians. I see Eastern box turtles, snapping turtles and painted turtles frequently, and on one hike I stumbled across a slender glass lizard, one of the Piedmont's more peculiar inhabitants. Lacking legs, handsomely striped and growing up to 4 feet long, slender glass lizards could pass for snakes, except they have eyelids, external ear openings and tiny vestigial hind legs. And they thrash about wildly whenever threatened, frequently dropping off much of their tails as a means of attracting a predator's attention while they escape.

A Park for Everyone

If anything is more varied than the park's habitat and terrain, however, it would be the cross-section of outdoor users who throng to Umstead. The park is smartly laid out, with camping facilities, ranger offices, picnic areas and cabins clustered in the northern and southern reaches of the park, leaving the huge middle section free of clutter. Hikers, of course, flock to the park and its 20 miles of foot trails. Some are easy strolls, such as the Crabtree Creek self-guided trail, a 1-mile loop with trailside markers keyed to a small field guide available from the Umstead office. Others careen across the park, linking up with side trails, making it easy to put together all-day hikes without ever walking on the same trail twice. Old mill sites along Crabtree and Sycamore creeks are a favorite destination, jumbled with huge granite boulders 250 million years old.

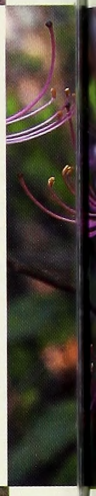
Horseback riding is popular, too, as is mountain biking, although bikers are restricted to bridle trails, which are relatively wide, well-graded paths. Umstead offers premier bird watching, for its mosaic of forest patches and the huge power line right-of-way create habitats for forest birds and early succession habitat species alike. One of Umstead's more intriguing outdoor pursuits is orienteering, a challenging map-and-compass sport in which participants follow a preset course over rough cross-country terrain using only navigation skills. Umstead's orienteering events, put on by the Backwoods Orienteering Klub of Raleigh, are a great introduction to the sport,

Among Umstead's *varied auditory delights are the chirp of the tiny spring peeper (above) and the gentle babble of one of the park's streams.*



A keen eye will *allow visitors to spot the colorful jack-in-the-pulpit (left) or perhaps even a spotted salamander.*

***Umstead's** many varied inhabitants include gray squirrels, wild azaleas and Eastern box turtles.*



***One of the** park's most distinctive features is the 50-acre Piedmont Beech Natural Area, a place that has been named to the National Registry of Natural Landmarks.*

You'll feel the corrugated soil of an old farm field beneath your feet and begin to understand the restorative powers of nature left alone.

with multiple levels of play to include those folks who simply want an excuse to go for a brisk walk in the woods. Umstead has also been a site for the new Internet-based outdoor sport called geocaching. Participants download Global Positioning System coordinates that guide them to remote sites where small packets of oddball treasures—bubble gum, books, CDs and the like—have been hidden, or "cached."

But the best parts of Umstead won't be found on the Internet, or even in local hiking guides. The best places are stumbled across while hiking the lesser-traveled trails, or even striking off cross-country with map and compass in hand and no particular destination in sight. I won't hint at the location of the big vernal pool where spotted salamanders gather in the late winter to lay their eggs, or the moss-carpeted bluff where the big creek takes a hairpin turn and you can eat lunch nearly surrounded by water. Don't ask me about the wooded ridge where the great horned owl spends most of the day in a white oak tree, or the tucked-away pond cove where I've caught some of the largest bedding bluegill I've ever seen.

I'll simply give you directions to the park's gates and suggest that you walk the regenerating woods yourself. You'll feel the corrugated soil of an old farm field beneath your feet and begin to understand the restorative powers of nature left alone. You'll start noticing bird's nests in the trailside shrubs, and maybe even convince yourself to invest in a cane pole. And then you'll start storing up some Umstead memories of your own. ⊠

WILLIAM B. UMSTEAD State Park

LOCATION: Wake County, about 10 miles west of Raleigh between U.S. 70 and I-40

SIZE: 5,439 acres

ACCESS: Open year-round. Automobile use is limited to certain park roads. Bicycles and horseback riders are welcome on designated trails. No motorized use of trails is permitted. Pets must be on a leash no longer than 6 feet.

HUNTING: Hunting is not permitted in state parks.

FISHING: Three man-made lakes are stocked with largemouth bass: 55-acre Big Lake and Sycamore and Reedy Creek lakes, about 25 acres each. Bream and catfish are also common catches. Rowboats and canoes are available for rent on Big Lake during summer and fall. Stream fishing in Crabtree and Sycamore creeks is allowed.

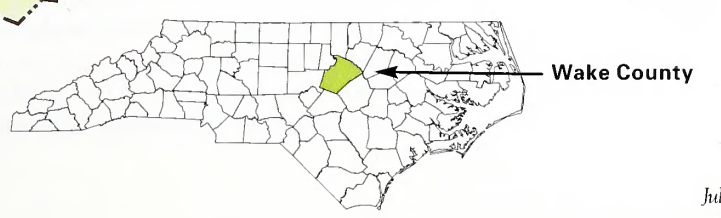
CAMPING: Tent, trailer (no hookups), group and primitive group camping facilities are available. Four camping areas are closed to upgrade facilities: The Youth Camp and the Maple Hill Lodge are scheduled to reopen Aug. 1, and the Crabtree and Lapihio areas are slated to open on Sept. 1. Call the ranger office to verify before planning a trip.

OTHER RECREATION: Bird watching is excellent, especially during the spring migrations. Rangers hold frequent natural history hikes and special programs. The bike and bridle trails are closed for repairs and are scheduled to reopen in late August.

MORE INFORMATION: Log onto the William B. Umstead State Park Web site at http://www.ils.unc.edu/parkproject/visit/wium/do.html, or call (919) 571-4170.

Source: N.C. Division of Parks and Recreation

GRAPHIC BY VICTORIA CUMBEE



BUILD IT,

JIM BUNCH

The Advance, a ship sunk for an artificial reef, is inhabited by a goby (above) and triggerfish (top).

More than 20 boats had gathered on the Meares Harris reef off Wrightsville Beach one cloudy spring morning. Suddenly the spitting rain subsided, the wind died, and a big patch of blue opened in the clouds overhead. At that moment, as if on signal, Atlantic bonito began to crash bait around us over at least 2 acres. Anchovies flew, hovering birds screamed and dived, and several anglers hooked fish simultaneously.

Mark Schmid pulled line off his fly reel onto the deck of the boat. He worked a few yards off the rod tip and stood prepared to cast. Meantime, Capt. Lee Parsons had teased the bonito closer with a topwater lure. But then a sudden strike took his plug under and put a sharp bend in the rod as a fish sped for the horizon.

"You're on your own," Parsons shouted. "I can't help you for a while."

Schmid's cast into the wind wasn't long, but it was long enough. He allowed the line to sink for a few seconds and began to strip.

"There he is, Lee," Schmid said, striking hard with a low rod tip. He released the line, and in two seconds had the fish on the reel.

JIM BUNCH

AND THEY WILL COME

THESE UNDERWATER JUNK PILES ARE PURE GOLD.

by Joel Arrington

Fishing went on like that for more than 10 minutes. Some anglers had time to catch as many as three bonito before the clouds closed in again, the fish disappeared and the wind picked up.

Atlantic bonito migrate through North Carolina's warming inshore waters in the spring. They prey on small baitfish such as anchovies and—like most opportunistic feeders—tend to remain near a source of food for variable periods of time, until their instinct to move on overpowers their desire to feed. But the bottom immediately off Wrightsville Beach is naturally smooth sand, offering little food and cover for bait species. The reason we found them there was the high-profile material a local fishing club and a government agency had sunk to the bottom. Between 1970 and 1984, the N.C. Division of Marine Fisheries sank three retired tugs, three old barges and a 440-foot liberty ship within a 300-yard radius. The eastern margin of the artificial-reef field is marked by a buoy 3½ nautical miles from the Masonboro Inlet.

Without such near-shore artificial reefs, anglers would probably catch only an occasional fleeting glimpse of fast-moving bonito as they pass through state waters. The fish would likely pause on wrecks farther offshore, out of range of most small-boat anglers, or over the few inshore outcrops of natural rock that manmade reefs imitate. Fishing opportunity would be much diminished for bonito, as well as for many of the most popular sportfishing species, including flounder, black sea bass, gray trout and bluefish. Spring and fall trigger annual king mackerel runs. The fish move through artificial-reef areas, feeding on schools of menhaden and sardines that are attracted to high-profile structures. During the spring and summer months, Spanish mackerel and cobia become abundant.

North Carolina reefs were developed to provide new fisheries habitat in both the ocean and the estuary, as well as more accessible fishing opportunity for anglers. Divers also visit reefs for nature observation, photography and spearfishing.

When the Japanese built the first artificial reefs some 200 years ago, they found that they quickly attracted aquatic life like magnets. During the past 20 years especially, as man has constructed thousands of reefs around the globe, we have learned that they can provide the scaffolding upon which marine organisms readily colonize. These organisms form the basis of a food chain that eventually includes the predator species that anglers pursue.

Research suggests that artificial reefs, if they are properly constructed and placed, can provide as much biodiversity as coral reefs, which are among the richest ecosystems on earth. The artificial substitutes are all the more needed and appreciated these days: Coral reefs have become seriously threatened in all the temperate and tropical oceans by coastal development, degraded water quality, damage caused by anchors and ship groundings, dynamite fishing, overfishing and global warming.

A United Nations report issued in September 2001 warned that the world's coral reefs are less than one-tenth as extensive as they were thought to be, and shrinking fast. More comprehensive mapping by the United Nations Environment Program showed that the reefs covered only a fraction of the area they had in previous studies—just 110,000 square miles, or less than one-tenth of 1 percent of the world's seabed.

Artificial reefs are built of any hard, durable material that simulates the habitat of marine species. Most are made of concrete or steel, usually surplus or scrap materials. More recently, but less frequently, artificial reef structures have been manufactured from concrete. Retired vessels are less durable than concrete materials, but are employed in construction of reefs for the high relief. North Carolina has also used fiberglass boat molds, military aircraft and boxcars.

At one time, discarded tires were sunk to be used for artificial reefs. The program failed because the tires could not be kept together. Cables bundling them corroded, and storms scattered them over the sea floor.

"All reef material has its advantages and disadvantages, and cost is only one factor," said Jim Francesconi, artificial reef coordinator for the N.C. Division of Marine Fisheries. A decommissioned military ship may be offered free but requires an expensive

A detonation on the retired vessel Pocahontas signals that a new artificial reef is on its way.

N.C. DIVISION OF MARINE FISHERIES

cleanup. Old ships and other materials may bring environmental problems associated with PCBs (polychlorinated biphenyls), petroleum products or lead, requiring as much as a $250,000 to $1 million cleanup. A steel ship also rusts and corrodes, flaking off desirable growth.

One of the best substances used for artificial reefs is concrete pipe. Manufacturers of concrete pipe incur a small percentage of flaws, and unwanted pipe can be made available to the state for only transportation and deployment costs. This structure is perfect for species such as grouper, snapper and sea bass that prefer low-relief reefs spread over a wide area. The concrete pipes also provide more surface to which organisms can attach. This tends to distribute users, which reduces crowding and potential conflict. Pipe has been stacked 15 feet high to create intricate habitat for juveniles of many important species.

Material type determines artificial reef life expectancy. Francesconi said the minimum life span worth considering is about 35 years. "As a rule of thumb," he said, "we expect the life of any reef material to at least equal the theoretical maximum life span of the target fish species we expect to occupy it. For some bottom species, that can run over 25 years."

Enterprising private firms have developed and patented structures that, they argue, are superior to discarded materials for artificial reefs. EcoReefs are spiky concrete structures, reminiscent of children's jacks. These objects are designed so that the biological reef can replace the artificial reef over time, leaving little evidence of human intervention. Hard corals can cover and weld together some modules, the manufacturers claim, and wave action will cause other modules to degrade and become incorporated into the reef sediment. Corals growing on scattered module fragments will have the opportunity to start new colonies. EcoReef installations, none of which have been placed in North Carolina, have an expected lifespan of seven to 15 years. This is more desirable, the manufacturers argue, than long-lasting man-made objects of "questionable ecological value."

Reef Balls are concrete igloolike structures with large holes through them. About 2,000 have been placed on North Carolina sites. Francesconi said they provide good coverage but typically are not stacked, and their cost runs high. Concrete I-beams, called "H" units, are more stackable but are still under evaluation. Fish Aggregation Devices (FADs) are plastic streamers or canvas cones placed on lines with floats at one end and weights on the other. Once thought to be a viable answer for attracting pelagic species, FADs proved insufficiently durable to biofouling and currents.

In addition to lasting, artificial reefs must attract fish. Marine Fisheries biologists test materials, usually against the concrete pipe

How It Works

The first organisms to attach themselves to a new reef normally are the barnacles and filamentous algae. Many small fish will arrive to browse on algae growth, and sea urchins soon feed extensively on this plant material. After six to nine months, the reef supports coral growth. The first to appear are soft corals, which can grow 2 to 3 inches in a year's time. After 12 to 15 months, hard corals can be found. Compared to the soft corals, they have a slower growth rate. Then several types of tunicates appear after a year. By this gradual accretion of life forms, a food chain develops. Artificial reefs allow a host of sea life to flourish in areas where it otherwise wouldn't.

Although it is clear that artificial reefs attract fish, controversy remains as to how or whether they actually increase fish production. A growing body of empirical evidence confirms, however, that when properly sited, designed and managed, artificial reefs do sustain selected fish populations. Artificial reefs off North Carolina supplement natural rock outcrops, which occur in greater numbers far offshore, particularly off Cape Fear.

"Any habitat has a limited carrying capacity," Francesconi said. "It will become saturated with life forms. Add an artificial reef among natural rock, and you provide new locations for eggs and larvae to settle."

Yet, the jury is still out. Do artificial reefs produce fish or merely attract them? Francesconi said the question should be, "To what extent do they attract and to what extent do they produce, and what is the relationship between those two functions?"

He conceded that, because artificial reefs are doing their job of providing fishing access to numbers of anglers, most tend to be heavily fished and therefore support predator populations well below their carrying capacity.

"If you're after big fish," he said, "you should look on natural rock. Fish artificial reefs farther offshore, such as AR300, 302 and 305 off Cape Lookout, which receive less pressure than reefs closer to shore.

"The greatest untapped opportunity is for bottom fishing for black sea bass and flounder and for groupers and snappers on deepwater sites. Anglers who anchor and fish the bottom while floating a live bait for king or Spanish mackerel tap into both the demersal and pelagic opportunities."

For the surface fishing, they might employ a light-tip rod on a revolving-spool reel with as much as 400 yards of high-visibility 20- or 25-pound-test monofilament line. Set a light drag. The terminal tackle would be much like that developed years ago for slow-trolling:

N.C. DIVISION OF MARINE FISHERIES

***A school of** baitfish swims by the remains of a ship sunk in the Gulf Stream off North Carolina's coast.*

Information

See the Division of Marine Fisheries Web site at http://www.ncdmf.net/reefs/

The publication *North Carolina Artificial Reef Guide* is available free on request by calling 1-800-682-2632, or (252) 726-7021.

standard, by underwater fish counts and by fishing with hook and line.

The state conducts a perpetual program of reef construction and enhancement. Typically, local interests supplement government funding. The Long Bay Artificial Reef Association, supported by the Brunswick, Oak Island and Ocean Isle fishing clubs, launched a campaign in 1984 to establish six reefs over a period of five years. It received $10,000 from the Brunswick County commissioners, which became the nonprofit's first major funding. By 1992 the initial six reefs were in place. They have since been enhanced and replenished by the addition of tugboats, barges and approximately 2 million pounds of concrete pipe and Reef Balls. By 1996 a seventh reef—AR 465, the "Gary Ennis Reef"—was established, funded by the Charlotte Offshore Sport Fishing Club. Two years later, 200 additional Reef Balls were added. Soon the association launched an annual fishing tournament, with proceeds dedicated to reef construction. With cooperation from the U.S. military, the year 2000 saw the additions of a barge and 600 additional Reef Balls to area reefs.

"Local contributions," Francesconi said, "can more than double the state's reef-building effort." ⊠

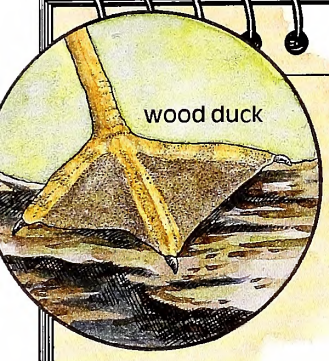
bronzed No. 4 or No. 6 strong hooks rigged on No. 4 or No. 5 coffee-colored wire so that one or more droppers trail from a hook through the bait's nose.

Menhaden may be captured with a cast net in creeks and boat basins and kept alive in a live well. Live bluefish, pinfish, spots or popeye mullet will also serve. Some anglers ladle overboard a mixture of fish oil and chicken feed to attract fish. They also might place the live-bait rod in a holder while fishing the bottom with a light spin or conventional rod and 12-pound test line. The terminal tackle could be a common two-hook bottom rig taken to the bottom with a round lead sinker of 1 or 2 ounces. Small fish caught with this rig can be used as bait on the rod fishing the surface or on the bottom rig for flounder and sea bass.

Other anglers might prefer trolling the reefs. Small spoons pulled rapidly on long mono leaders are effective for Spanish mackerel and crevalle jacks in summer. Light graphite rods with 10- to 14-inch butts fitted with small reels with 12-pound test line are about right. In the heat of summer, fish 25-foot leaders of 20-pound mono behind No. 1 planers and keeled bead-chain sinkers. Line twist can trouble anglers pulling this kind of rig, but it can be overcome with a high-quality, stainless-steel, ball-bearing swivel in the leader.

JOEL ARRINGTON

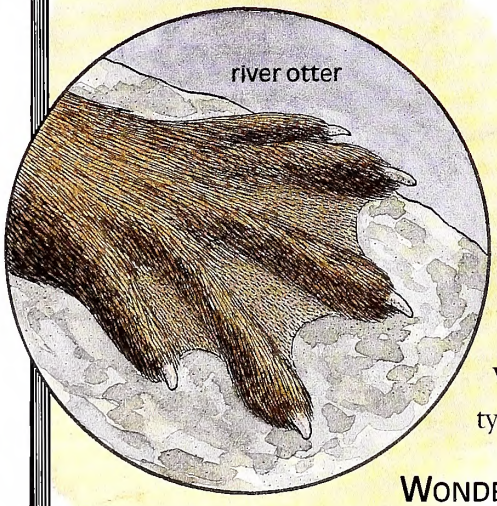
***Fishing over artificial reefs** can pay big dividends such as this Atlantic bonito caught on a fly rod.*



Animal feet are pretty amazing.
If anyone asks you to name something that can paddle, catch prey, climb, grab, dig and float on water, you can say:

Fantastic Feet!

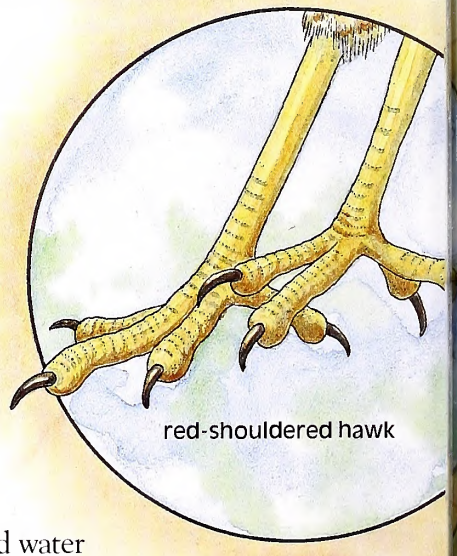
written by Marianne Wallace / illustrated by Consie Powell
nature activity by Anne M. Runyon

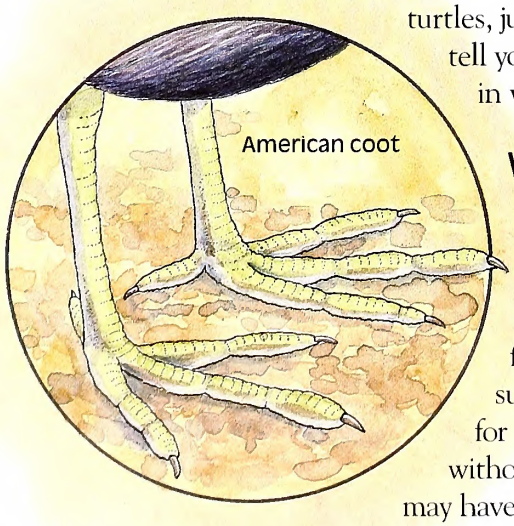


The next time you walk along the muddy edge of a pond or along the wet sand at the beach, look at the ground. You may see the footprints or **tracks** of the animals that walked there before you. Are there different shapes and sizes of tracks? Can you guess the types of animals that made them? Why do you think animals have different shapes and types of feet?

WONDERFUL WEBBED FEET

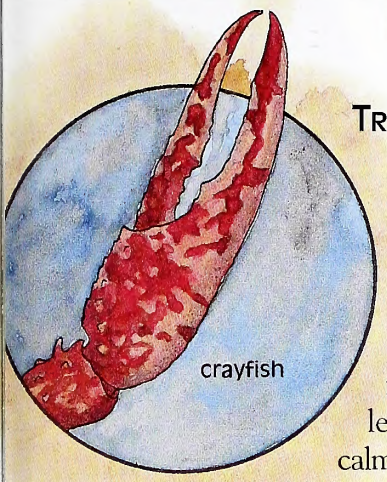
Animals in various **habitats** have developed **adaptations** to their feet that help them survive. Some of the tracks at the beach were probably made by gulls with **webbed feet** designed for paddling in the ocean. Inland along the edge of a pond, you might see the tracks of other birds such as ducks and geese that also have webbed feet to paddle through the water. And even if you didn't know the habitat of river otters, frogs and some turtles, just looking at their webbed feet should tell you that they live at least part of their lives in water, too.

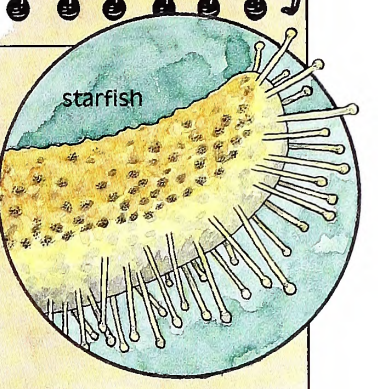




WADERS AND WATER WALKERS

But not all animals that live in or around water have webbed feet for swimming. A water strider is an insect that can walk on the surface of ponds and other calm water. Unlike the claws most insects have on their feet, the water strider has hairs that help it float on the surface without sinking. And if the area is marshy, look for wading birds. Their feet are adapted to walking in mud without sinking because their toes are long and spread out or may have webbing along their edges.

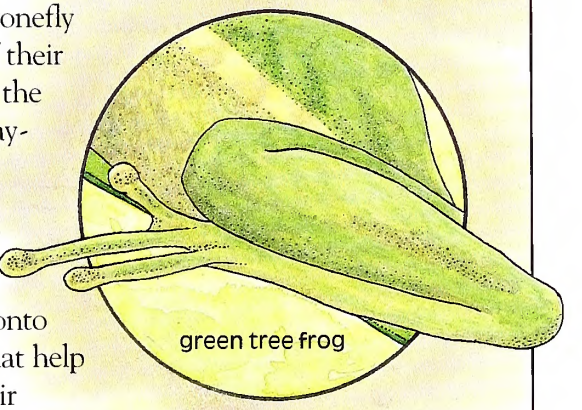




TREADING IN THE DEPTHS

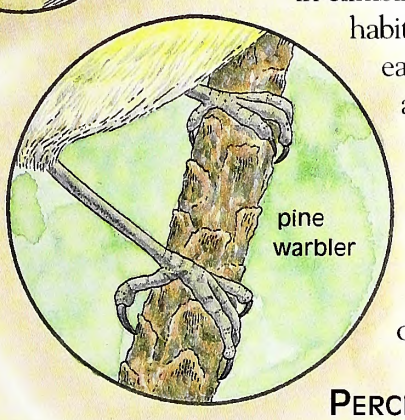
Adaptations to the feet of animals that live underwater are harder to see. Starfish move along the ocean bottom using **tube feet**. These narrow sucking tubes are also used for holding onto clams and other bivalves and then pulling the two shells apart so the starfish can eat the animals that live inside.

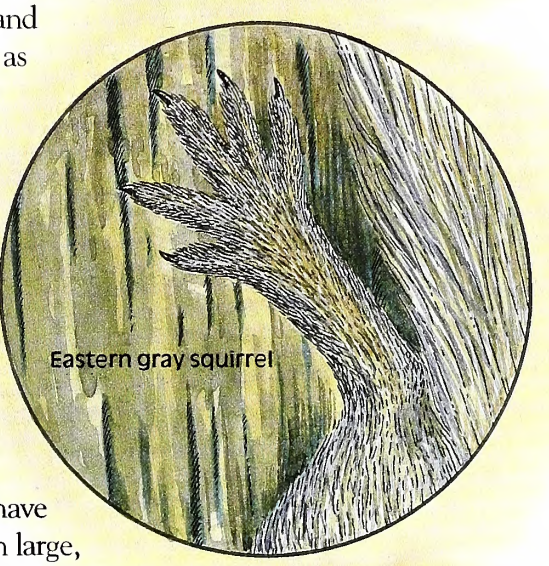
In the rushing water of mountain streams, stonefly nymphs cling to rocks with claws on the ends of their legs that prevent them from being swept away. In the calmer water of ponds and slow-moving streams, crayfish have pincer-shaped **forefeet** to catch and hold food.



CLIMBING UP, CLIMBING DOWN

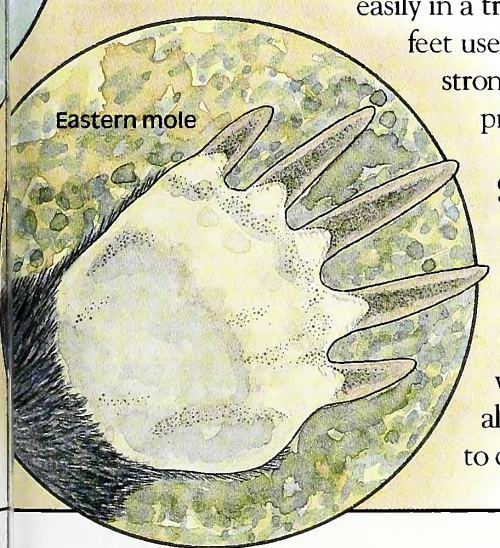
A walk in the woods is a great place to see how animals use their feet to climb trees and grab onto branches. The toes of tree frogs have sticky pads that help in climbing trees and other vegetation in their habitat. Feet that end in sharp **claws** make it easier for squirrels to climb trees, and ankles that twist around make it as easy to climb down headfirst as it is to climb up. Their forefeet work similar to human hands as the squirrels grip branches and hold onto acorns and other food.





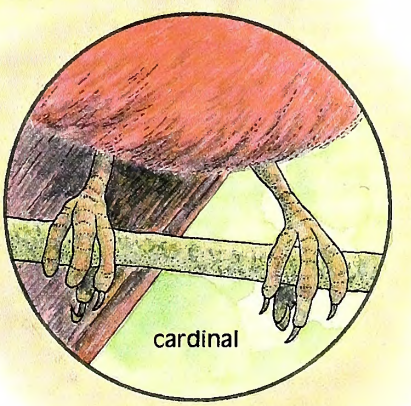
PERCHING ON BRANCHES

Many of the birds in wooded areas are perching birds such as cardinals and warblers. Their three front-facing toes and one back-facing toe wrap around branches so they can perch or sit easily in a tree or bush. Hawks and eagles also have feet used for perching, but their toes end in large, strong claws called **talons**. The talons kill and grip prey animals.



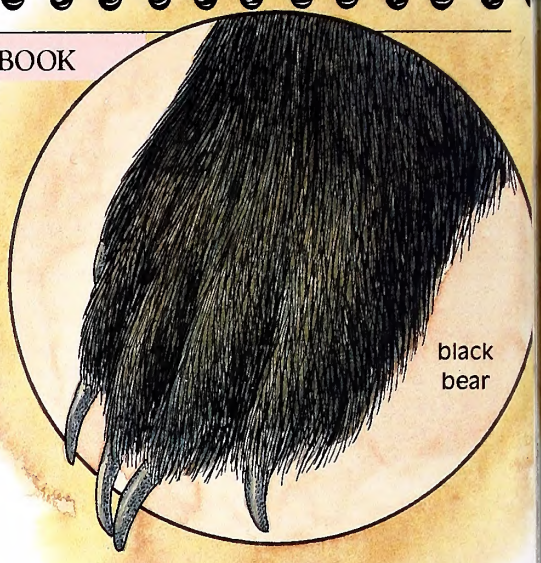
STRONG DIGGING FEET

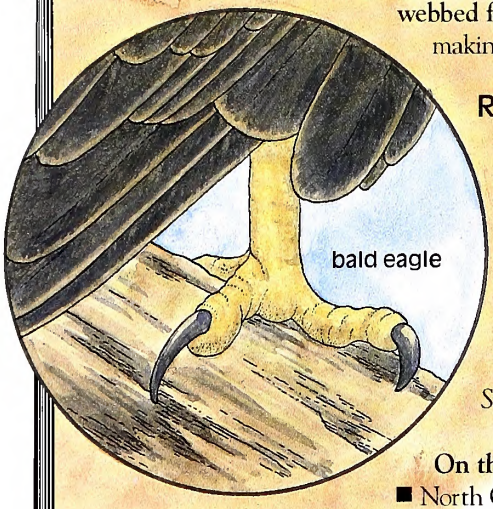
Some animals of woodlands and meadows use their clawed feet in other ways. Moles use the strong claws on their forefeet to dig underground tunnels as they hunt for earthworms, insects and other things to eat. Bears also have strong claws on their feet, using them to dig for food, climb trees and even catch fish.



What Does It Mean?

adaptation: a change in a plant or animal making it better suited to its environment
claws: the pointed nails on some animals' feet often used for gripping, digging or climbing
forefeet: the front feet of an animal
habitat: an area that provides the special environmental needs of certain plants or animals, such as food, cover and water
talons: the large, strong claws of birds such as hawks and eagles
tracks: footprints or other marks left behind by an animal
tube feet: the short tubes on the bottom of a starfish used in holding onto prey and moving along the ocean bottom
webbed feet: feet with areas of skin connecting the toes, making it easier for the animals to move through water



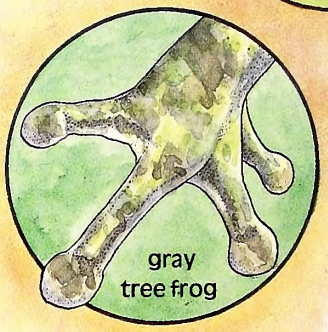


Read and Find Out

- *A Field Guide to Animal Tracks* (Peterson Field Guides) by Olaus Murie, Houghton Mifflin Co., 2nd edition, 1998.
- *Animal Tracks of the Carolinas* by Tamara Eder and Ian Sheldon, Lone Pine Publishing, 2002.
- *Animals in Motion* by Pamela Hickman, Kids Can Press, 2000.
- *Familiar Animal Tracks* (Audubon Society Pocket Guides), Alfred A. Knopf, 1993.
- *Tracking and the Art of Seeing: How to Read Animal Tracks and Sign* by Paul Rezendes, Harper Collins, 1999.

On the World Wide Web:

- North Carolina plants and animals: www.main.nc.us/naturenotebook/index.html
- Some information and drawings on animal feet: www.k12.de.us/warner/feet.html



Get Outside

Make casts of animal tracks: Take a morning walk along a trail, streambed or shoreline where there is fine sand or dirt. Look carefully at the ground—do you see the tracks of animals that have been there? You may see prints made by ducks and other birds, foxes, opossums, rabbits or other common animals.

1. Take a long strip of stiff paper about 1.5 inches wide and 18 inches long and make it into a circle, using tape or a large paper clip to hold it together. Put this paper ring around the animal track and gently push it slightly into the sand or dirt.

2. Mix up some patching plaster (get it at a building supply store) and water in a clean, empty can, using a plastic spoon. Make it the consistency of thick pancake batter. Quickly but gently pour the patching plaster over the animal track. The paper ring should hold the plaster in place until it is firm and dry, about 5-10 minutes. Carefully lift it up and turn it over. Set it in a box or other safe place for one day or until totally dry. Peel away as much of the paper ring as you can. Use a soft brush to remove as much sand or dirt as possible. Do not rinse it under water, or the plaster may wash away.

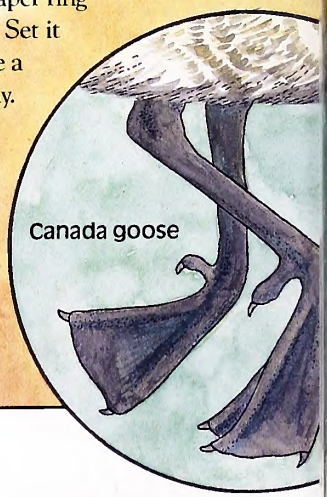
3. Write your name, the date and place where you found the track on the smooth side of the cast. Can you identify the animal that made the track? If you can, write the animal's name also.

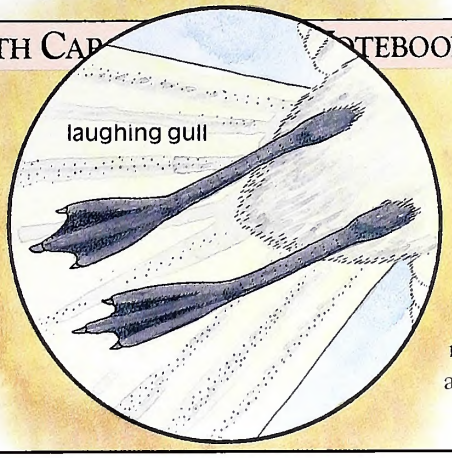
4. Spray the cast liberally with cooking spray or rub with cooking oil.

5. Place your cast, track side up, on some newspapers. Put another paper ring around the cast, one that is about 1 inch taller than the cast.

6. Pour patching plaster onto your first cast and let it dry (as in step #2).

7. When it's dry, peel away the paper and separate the two casts. The newest cast should look just like the animal's footprint.





It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

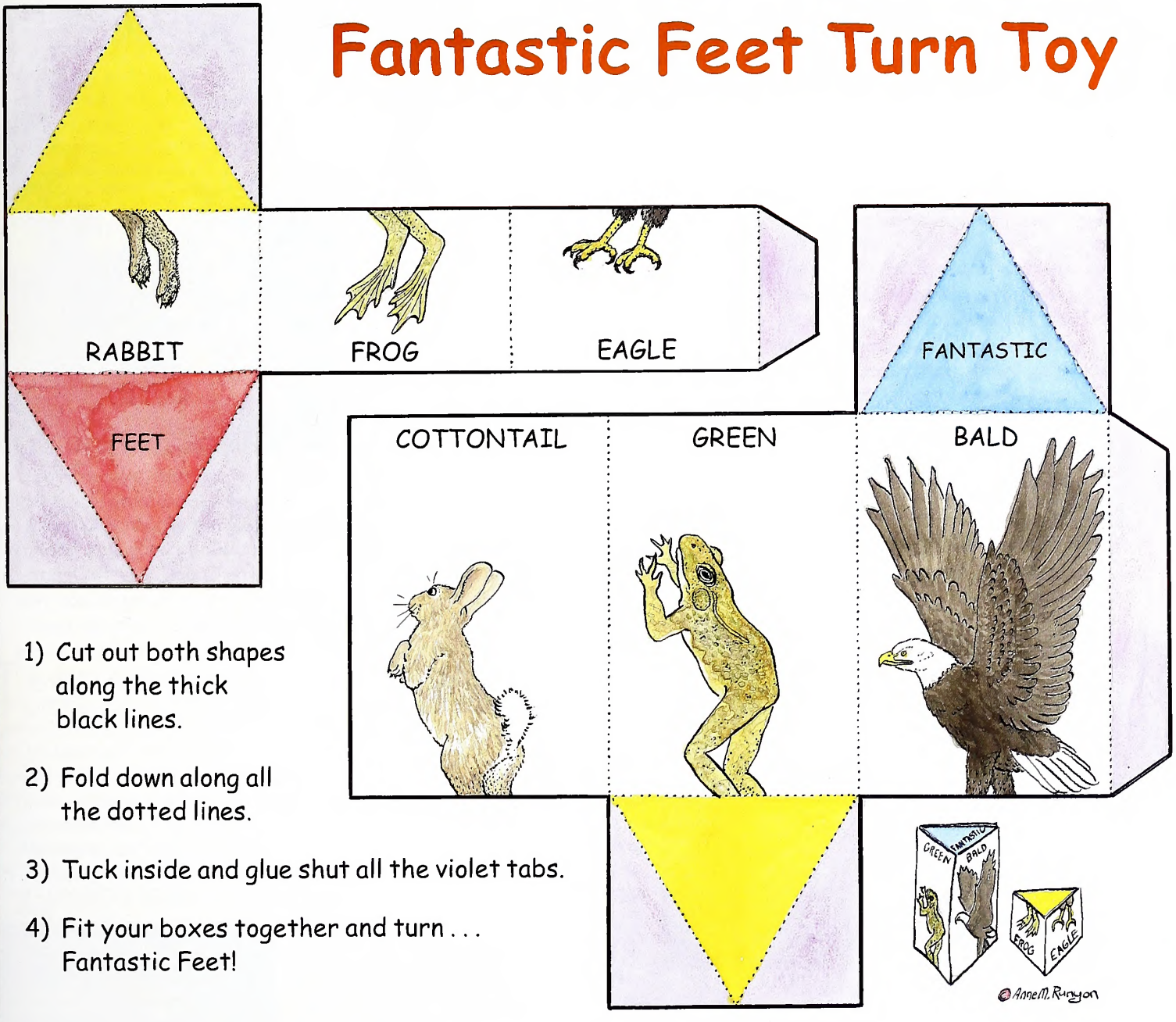
Tracks! teaches students to recognize and identify common animal tracks.

Adaptation Artistry teaches students to understand a variety of adaptations that help suit birds to their habitats and lifestyles.

Get WILD

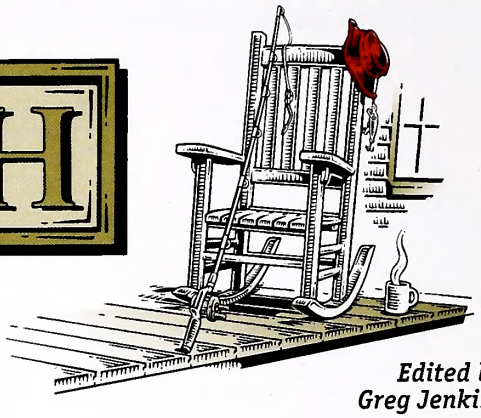
WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at **www.ncwildlife.org** and click the link for **education/workshops**.

Fantastic Feet Turn Toy



BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

Stay Sharp by Hunting During the Summer 'Offseason'

During the heat of summer, between the spring turkey season and the fall and winter game seasons, hunters can keep their skills sharp with nontraditional quarry. In North Carolina, game species with no closed season include groundhogs, beavers, nutria and coyotes. Crows can be taken on Thursday, Friday and Saturday of each week from June 1 through the last day of February, plus Labor Day and Christmas.

Even though groundhogs, beavers, nutria and coyotes have no seasons and no bag limits, hunters should remember that there are regulations to follow. Hunting hours are one-half hour before sunrise to one-half hour after sunset. Weapons allowed are rifle, shotgun, pistol, bow and arrow, and dogs. Artificial lights are not allowed, but electronic calls are permitted in the case of coyotes and crows. Hunting is not allowed from vehicles, motorboats or aircraft.

KEN TAYLOR

***The semiaquatic nutria** is a worthy game animal to keep hunting skills sharp through the summer.*

"I've only been hunting crows for a couple of years and still have a lot to learn, but I always have a good time," said Terry Sharpe, the North Carolina Wildlife Resources Commission's agricultural liaison biologist. "We particularly enjoy the challenge of calling in the crows and the occasional fast shooting when everything goes right. Besides, we can always find farmers eager to let us crow hunt on their property."

Hunting for crows, nutria, beavers, groundhogs or coyotes on game lands is restricted to the times of year when there is an open season on big game, small game or waterfowl. A hunting license is necessary, unless you are hunting on your own property.

"I started hunting groundhogs years ago to control a nuisance situation," said David Rowe, technical guidance biologist. "Lots of hunters targeting nuisance wildlife finely tune their rifle handloads for pinpoint accuracy and pride themselves on their ability to get clean shots at long distances. It is a good offseason activity that helps control nuisance situations and keeps hunters in practice for rifle use during deer season."

For more information on all hunting season rules and regulations, sportsmen should obtain a copy of the *North Carolina Inland Fishing, Hunting & Trapping Regulations Digest* online at www.ncwildlife.org, by calling (919) 733-7291, or wherever licenses are sold.

On Patrol

ILLUSTRATED BY JACKIE PITTMAN

Wildlife Master Officer William Carlisle responded to a call from the Catawba County Sheriff's Department concerning a closed-season deer poacher being detained by a citizen. When Carlisle arrived, he found a male subject sitting on the ground, hands tied behind him with rope, with a 60-year-old woman standing beside him. The woman informed the officer that the man had shot a deer on her property with a gun—it was bow-only season—and he wasn't going anywhere until he was arrested. There was a .50-caliber muzzleloader lying beside the man on the ground. After taking five minutes to untie the man, Carlisle had the subject show him the deer he had shot. The subject was charged with closed-season deer hunting. No word on whether the woman has made any further citizen's arrests.

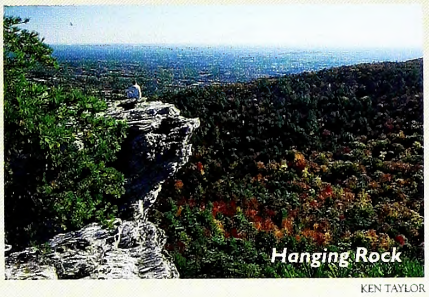
State Parks Tally Record Attendance in 2002

KEN TAYLOR

A record 13.2 million people visited North Carolina's state parks in 2002, according to final tallies from the N.C. Division of Parks and Recreation. The visitation totals represent an increase of 5 percent over 2001 and a 160 percent increase during the past 20 years. In 1982, 5.1 million people visited the parks system.

Also in 2002, five of the system's 33 parks and recreation areas logged more than 1 million visitors: Jockey's Ridge and Fort Macon state parks and Falls Lake, Jordan Lake and Kerr Lake state recreation areas. Jordan Lake, Kerr Lake and Fort Macon also rank among the top 10 tourist destinations in North Carolina, according to the N.C. Department of Commerce.

"Interest in our state parks jumps during difficult economic times," said Phil McKnelly, director of the division. "The parks offer inexpensive family entertainment and education that's close at hand. Also, the parks have more types of recreational activities and educational programs than ever before."



KEN TAYLOR

Eighteen state parks experienced increases in visitation during the year, the most significant being Fort Fisher State Recreation Area (49 percent), Lake Norman State Park (41 percent), Gorges State Park (53 percent), Jordan Lake State Recreation Area (25 percent) and New River State Park (18 percent). As of Dec. 30, 2002, the parks system operated with a field staff of 299, including 156 rangers and superintendents. If averaged throughout the system, each ranger or superintendent would have served 84,615 visitors during the year.

"We're thrilled that more people are discovering state parks, but the record numbers came at a difficult time for us," McKnelly said. "State budget difficulties forced the loss of 15 positions, and a hiring freeze left many parks shorthanded. That so many people found a good experience in our parks is a tribute to the dedication of our permanent rangers and maintenance staff."

Throughout the 1980s and 1990s, visitation at the state parks grew at a faster rate than the state's population. Among all outdoor attractions in North Carolina, the parks system as a whole is second in visitation only to the Blue Ridge Parkway.

TOP 15 STATE PARKS

In 2002, a record 13,212,854 people visited North Carolina state parks. Here are the top 15 parks in terms of attendance.

Kerr Lake	1,574,188
Jordan Lake	1,537,319
Fort Macon	1,300,036
Jockey's Ridge	1,016,944
Falls Lake	1,010,996
Fort Fisher	993,167
Mount Mitchell	560,461
Stone Mountain	453,157
Morrow Mountain	418,080
Pilot Mountain	392,305
Hanging Rock	390,827
William B. Umstead	387,493
Lake Norman	362,902
Eno River	292,018
Crowder's Mountain	283,888

Crab Pot Roundup Nets Big Rewards

The North Carolina Marine Patrol located 4,121 abandoned crab pots and 953 ghost crab pots during the recent clean-up period for fishing pots in Tar Heel coastal waters. Crabbing is one of the state's most important commercial activities, bringing in more than $29 million in 2002, and it is also an important recreational pastime. An estimated 1.3 million crab pots are fished in state waters each year.

Abandoned pots still have the fisherman's identification on either the buoy or the pot, while ghost pots have no identification or buoy. If left in the water, these pots continue to catch crabs and other marine life, presenting a conservation problem. To locate abandoned and ghost pots, fishermen are required to remove all their pots from the water Jan. 24–Feb. 7.

MELISSA McGAW

Locating and then removing such a large number of pots from the water is both labor-intensive and time-consuming. The state Division of Marine Fisheries is looking for solutions to deal with the large number of abandoned and ghost pots. Options being considered during the revision of the Blue Crab Fishery Management Plan are shorter attendance periods, biodegradable panels and additional clean-up weeks.

Fishermen are required to fish their pots a minimum of every seven days. It is each fisherman's responsibility to keep track of their pots and remove them from coastal waters when pots are not tended regularly.

For more information, please contact Col. Joe Lynch of the N.C. Marine Patrol by e-mail at joe.lynch@ncmail.net or by phone at (252) 726-7021 or (toll free) 1-800-682-2632. To learn more about the Blue Crab Fishery Management Plan, please contact Lynn Henry at lynn.henry@ncmail.net or (252) 796-1322 or 1-800-405-7774.

Fishermen Net More Seafood in Fewer Trips

MELISSA McGAW

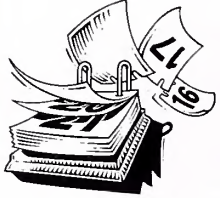
Fishermen brought more seafood to the docks in 2002 but made fewer trips to catch finfish, crabs, shrimp and shellfish, according to harvest statistics from the North Carolina Division of Marine Fisheries. Commercial fishermen landed 160 million pounds of fish and shellfish, with the catch valued at $94.6 million. Total landings were up 22.9 million pounds from 2001, but fell slightly below the previous five-year average of 170 million pounds. The value of the 2002 harvest was up $6.6 million from 2001, but below the five-year average of $101 million.

The top five species commercially harvested were (by value) hard blue crabs, $29.3 million; shrimp, $18.3 million; summer flounder, $6 million; Atlantic menhaden, $5 million; and hard clams, $3.5 million. Values are calculated by the amount fishermen are paid for their catch. Sixty-nine million pounds of Atlantic menhaden were harvested, followed by 36.4 million pounds of hard blue crabs, 10 million pounds of Atlantic croakers, 9.9 million pounds of shrimp and 4 million pounds of summer flounder. Although the catch increased in 2002, effort dropped by 31,024 fishing trips. The bulk of the decline came from the blue crabs fishery, which fell by 15,000 trips from the previous year.

Landings fluctuate for a variety of reasons—availability of fish or shellfish, market conditions and harvest restrictions all impact the amount of seafood harvested. All of these factors affected North Carolina's 2002 fishing year. Visit the Division of Marine Fisheries' Web site at www.ncdmf.net/statistics/index.html to view harvest statistics by year.

did YOU know?

North Carolina has reciprocal fishing agreements with Tennessee and Virginia. That means if you are fishing on a body of water such as Kerr Lake, which straddles the North Carolina-Virginia state line, you only need a North Carolina license. North Carolina and South Carolina do not have such an agreement. So if you are fishing on Lake Wylie, you must have licenses from both states—or make sure you don't drift south of the border.



Calendar of Events

SATURDAY, JULY 19

Bring your pet reptile to the Reptile Beauty Pageant in Asheville for a day of education. Call (828) 298-5600 or visit www.wildwnc.org.

SATURDAY, JULY 26

Enjoy demonstrations, competitions and food at the Bogue Sound Kayak Fest at Indian Beach. Call (252) 247-7787 or visit www.islandrigs.com.

SATURDAY, JULY 26

Practice mountain biking skills, maneuver around a challenge compass course, join a guided tour on accessible trails, and learn about Air Awareness and Leave No Trace Ethics at Outdoor and Air Awareness Day at the Cradle of Forestry in America, located near Brevard in Pisgah National Forest. Call (828) 877-3130 or visit www.cradleofforestry.com.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to greg.jenkins@ncwildlife.org, or call (919) 733-7123, Ext. 264.

Sharpe Wins Award for Work with CURE

N.C. Wildlife Resources Commission agricultural liaison biologist Terry Sharpe has won a national stewardship award from Partners In Flight for his work with the commission's Cooperative Upland-habitat Restoration and Enhancement (CURE) program. CURE, which Sharpe helped create, focuses on restoration and management of early succession habitat. The program has established management plans for habitat improvement on more than 38,000 acres of public and private land.

The American Birding Association sponsored the Partners In Flight awards, which were presented by U.S. Fish & Wildlife Service director Steve Williams during the North American Wildlife and Natural Resources Conference in Winston-Salem recently. Partners In Flight is a cooperative effort involving partnerships among federal, state and local governmental agencies, philanthropic foundations, professional organizations, conservation groups, industry, the academic community and private individuals.

Each year, Partners in Flight presents awards to those individuals or groups who have made exceptional contributions to the field of landbird conservation. Sharpe has dedicated much of his career to promoting conservation of early succession bird habitat. His accomplishments include working to improve and implement federal Farm Bill conservation programs on private lands, promoting controlled burning to benefit wildlife and participating in research programs to develop ways to benefit wildlife on working farms.

KEN TAYLOR

***Sharpe (right) was honored** for his work promoting the conservation of early succession habitat.*

Flatheads Right at Home in Cape Fear River Basin

JODY DUGGINS

Flathead catfish like this lunker *are fun to catch and will eat almost anything live they can swallow.*

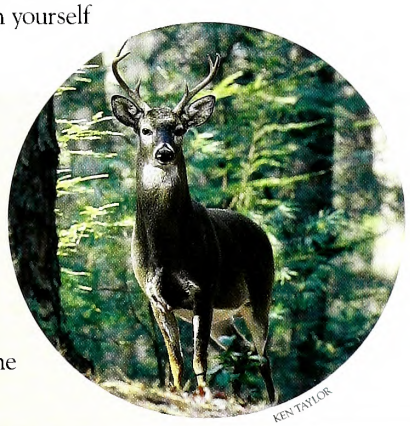
It seems like a catfisherman's dream: a big, hard-fighting, fast-growing, good-tasting species of catfish that is spreading quickly across central and eastern North Carolina. But this species is no dream. Non-native flathead catfish have quickly become a dominant predator and a serious problem in the Cape Fear River basin.

Unlike your average bottom-dwelling channel, blue or bullhead catfish, this whiskered monster is the aquatic equivalent of the mountain lion, patrolling in dark water and eating anything live it can fit in its mouth. Turning up their noses at chicken livers and cheese, flatheads will eat any fish species and reportedly will consume crabs, crayfish, nightcrawlers, salamanders, duck chicks and small swimming mammals such as mice or muskrats.

The big cats, which can grow as much as two or three pounds a year and live 20 years, have established breeding populations in the upper Cape Fear River and lakes such as Sutton Lake. Because flatheads eat so much—needing 10 pounds of food to gain one pound—they have the potential to wreak havoc on native species like the endangered Cape Fear shiner. The mudcats have thrown biologists another curveball: In their native habitat of the Mississippi River and its tributaries from Minnesota to the Gulf of Mexico, studies found that flatheads stayed within 1 mile of where they were originally found. N.C. State University researcher Tom Kwak discovered the big fish moving around in the Cape Fear as much as 30 to 40 miles from where they were initially found, which has enabled them to spread so quickly. Flatheads have also been found in the Neuse, Lumber and Waccamaw river systems.

The North Carolina Cooperative Fish and Wildlife Research Unit, a joint venture headed up by Kwak involving the Wildlife Management Institute, the N.C. Wildlife Resources Commission, N.C. State University and the U.S. Geological Survey, will present a report to the commission in September. Stay tuned for the results of that survey. And in the meantime, go out and catch yourself a few of these lunkers. For more information on flathead catfish, visit www.flatheadcat.com.

Bald Head Island Culls Deer Herd


KEN TAYLOR

Bald Head Island recently completed the first culling of its burgeoning deer herd, and information gathered suggests that the project was a success. Under the terms of a special depredation permit issued by the state Wildlife Resources Commission, five hunters killed 149 deer in seven dusk-to-dawn hunts using .22-caliber rifles, spotlights and bait. The island's herd of a few dozen deer in the late 1990s had expanded to around 500 last fall, and the growth rate of the herd was projected at 60 percent, meaning that action had to be taken immediately.

The Brunswick County island was gradually being eaten away by the deer population, which feasted on fragile maritime forests and residents' gardens. With no cars allowed on Bald Head and no natural predators present, the deer population thrived and left village leaders with no choice but to thin the herd. Some residents favored less lethal population control methods such as capture and removal or contraceptive darts, but those ideas were deemed unfeasible by the village council.

Commission biologists found the culled deer to be in good health, with no diseases. It has not yet been determined if the deer culling will become an annual event.

USDA Takes Action Against Chronic Wasting Disease

The U.S. Department of Agriculture is making $4 million available to assist state wildlife agencies with control of chronic wasting disease. "USDA is committed to assisting states, federal agencies and tribes in controlling the growing threat to elk and deer from chronic wasting disease," Secretary of Agriculture Ann Veneman said.

In May 2002, the USDA and the U.S. Department of the Interior formed a joint working group to assist states in responding to chronic wasting disease, which causes holes to form in an animal's brain and leads to death. The malady has been found in wild deer or elk in Colorado, Illinois, Nebraska, New Mexico, South Dakota, Utah, Wisconsin and Wyoming. The disease has also been found in captive herds in several other states, but has not been found in North Carolina.

Nature's Ways

Racing Stripes

written by Jeff Beane
illustrated by Jim Brown

Imagine a midday trek across a Carolina sand ridge in August. It's downright miserable, withevery living thing seemingly subdued by the oppressive heat. But one creature is stirring, though all you may see of it is a blurred streak amid the wiregrass.

Enamored of sun and sand, the six-lined racerunner (*Cnemidophorus sexlineatus*) is North Carolina's fastest terrestrial reptile (some sea turtles may swim faster). *Guinness World Records* proclaims it the world's fastest, at 18 mph. But since relatively few lizard species have actually been clocked, it is doubtless that others are equally speedy.

Most abundant in open, sandy areas in our Coastal Plain and Sandhills, racerunners also occur spottily in the Piedmont and mountains. Though sometimes confused with skinks, which also have stripes, racerunners belong to a different family. They have six stripes (skinks have five), granular dorsal scales (skinks have smooth, shiny scales), and do not climb (skinks often ascend trees when pursued). Longitudinal stripes apparently confuse predators, especially on moving prey. And moving is something racerunners excel at, having exchanged typical lizard climbing skills for blazing speed on the ground.

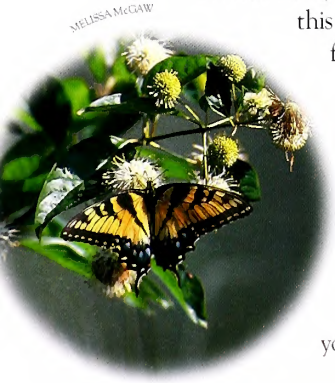
To see them up close, catch racerunners under cover on cool mornings; otherwise, pick a shady spot and watch them in action on the hottest days of the year.

Wildlife through the Year

Butterfly Bar

The summer-heat knob is now turned toward high, and my thoughts are becoming ever more consumed with cold liquid refreshments. There's nothing like a tall, iced drink to bring one's internal operating temperature back toward normal.

Like humans, wildlife also need relief during the drier months of the year. So, this year, I plan to build a small "watering hole" for butterflies in my front-yard flower bed.


MELISSA McGAW

To create a butterfly hole, take any flat, shallow saucer and place it in a hole, level with the ground. The saucer should be in an area that receives direct sunlight and is sheltered from wind. Next, fill the saucer with sand, rocks and shells, then add enough water to dampen the sand. If you hope to quickly attract butterflies, try adding a small piece of banana.

When you're finished, go pour yourself a cold beverage and watch as some of the world's most beautiful insects come to join you for an afternoon drink.

—*Chris Powell*

Plants That Attract Butterflies

SHRUBS: butterfly bush, hibiscus, azalea, spice bush, lilac, lantana, Japanese wisteria
ANNUALS: aster, marigold, verbena, petunia, zinnia, snapdragon, bellflower
PERENNIALS: butterfly weed, daylily, black-eyed Susan, coreopsis, foxglove, bee balm, phlox, cardinal flower, purple coneflower, goldenrod, yarrow
HERBS: sage, chives, fennel

Catch Us at these Numbers

1-800-662-7137 to repart vialatians of hunting and fishing lows

1-800-628-3773 (NC VESSEL) far baat registrotion and titling

1-800-675-0263 for hunting dotes and shaoting haurs for migratary gome birds

1-888-248-6834 (2HUNTFISH) ta purchase most licenses with VISA or MosterCard using a tauch-tone telephane

1-800-446-8663 (I GOT ONE) to repart big gome harvests

Connect ta the commissian's Web site at **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $52,441,263.66

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

N.C. WILD STORE

CONTINUE *the* TRADITION

2003
North Carolina Migratory Waterfowl Print and Stamp Set

Cypresses stand as sentinels along a black-water bay. A splash breaks the morning stillness, and a Boykin spaniel retrieves the kill. Wilhelm Goebel's "Traditions at Suggs Mill Pond" portrays the artist and his daughter duck hunting on Suggs Mill Pond Game Land. When you buy North Carolina's 21st waterfowl print and stamp, you contribute to wetlands conservation and commemorate our hunting heritage. Overall print size: 12" x 14"; image size 6 ½" x 9". The set includes a free museum-edition print of Ron Louque's "Canvasbacks at Whalehead." *(See the description below for additional information.)*

No shipping-handling fee or discount applies.

2003 Print and Stamp Set
$145 ITEM CODE **DSP03**

2003 Mint Stamp Only
$10 ITEM CODE **DSPS03**

"Canvasbacks at Whalehead"

Free *with purchase of 2003 print & stamp set*

This limited-edition museum print of a Ron Louque painting depicts canvasbacks in flight above the historic Whalehead Club in Currituck County. It is a gift when you purchase the 2003 state or federal print and stamp set, and it is also sold separately. Overall print size: 19" x 24"; image size 13" x 18". *No shipping-handling fee or discount applies.*

$50 ITEM CODE **FA1**

The 2003-2004 federal duck stamp print featuring Ron Louque's winning entry is also available. (See page 40 for details.)

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

▲ Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

▲ Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

▲ **Largemouth Bass.** This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12LRG** (large)
A12XXL (extra extra large)
Extra large size is no longer available.

left front design

▲ **Snow Geese.** Celebrate waterfowl conservation with this white, all-cotton tee. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this all-cotton tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail and tree. Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

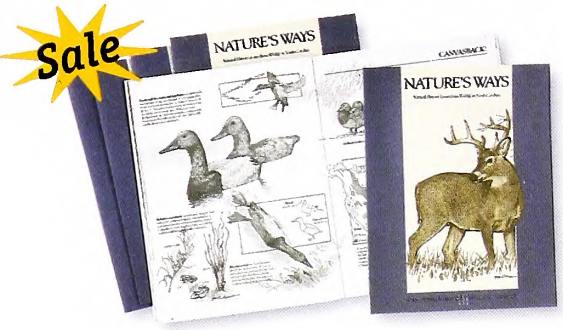
Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams. Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**



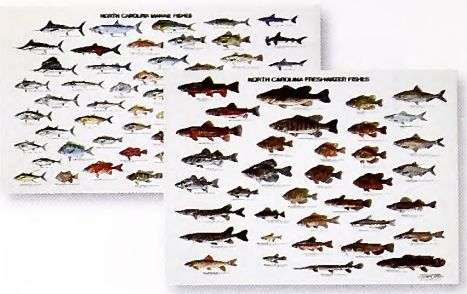
Nature's Ways Collection ▲

Looking for drama and science combined? "Nature's Ways" will deliver. Includes a comprehensive index.

Half-price while supplies last.

Boxed Set $15 ITEM CODE M10

Unboxed Set $13.75 ITEM CODE M9



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE P9

◀ Rivers of North Carolina

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* (Nov. 1999) chronicles the natural history of 17 major river basins.

Half-price while supplies last.

$5 ITEM CODE M11

◀ North Carolina WILD Places: A Closer Look

Book and Posters Set.

Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a WILD Places map by Jackie Pittman make this set a teaching tool.

$16 ITEM CODE E6

Dogs that Point, Fish that Bite ▼

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

Hardbound ~~$19.95~~ $14.95

ITEM CODE M8

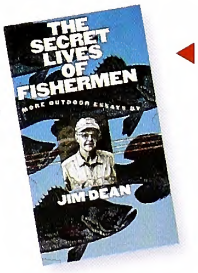
Paperback ~~$10.95~~ $8.00

ITEM CODE M12

Set of both volumes

Hardbound $30.00

ITEM CODE M14



◀ The Secret Lives of Fishermen

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound ~~$24.95~~ $18.50

ITEM CODE M13

Items not pictured:

All Things Are Connected

Video and Activity Guide. Chief Seattle's 1855 speech inspired this film and activity guide for classrooms and groups. $22 ITEM CODE W3

Bird Houses and Feeders

This guide to building birdhouses includes tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE M6

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE M2

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set. $2 ITEM CODE M5

N.C. Wildlife Viewing Guide

Discover 90 of the state's premier viewing locations. $5.95 ITEM CODE N6

2003-2004 Federal Duck ▶ Print and Stamp

Greater snow geese take wing over the Chincoteague National Wildlife Refuge on the 70th edition of the federal duck stamp. Artist Ron Louque is making signed prints of the stamp available, and we have a limited number. Overall print size: 12" x 14"; image size 6 1/2" x 9". Includes a free museum print of the artist's "Canvasbacks at Whalehead."

(See page 37 for details.)

A $9.50 shipping and handling fee applies.

This item not subject to 15% discount.

Print $189 ITEM CODE FDSP03

Stamp $16 ITEM CODE FDSS03

At Your Service

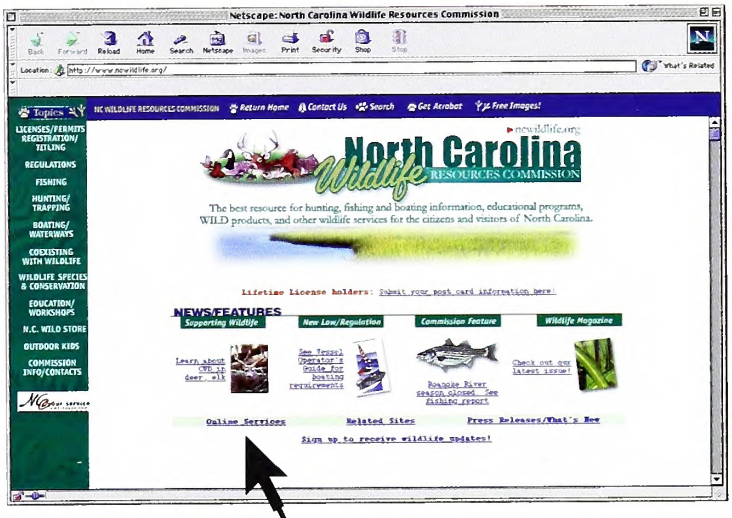
WILDLIFE COMMISSION SPOTLIGHT

Online Services

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

The North Carolina Wildlife Resources Commission has made great strides toward making public services more convenient. Much of this effort has focused on automated services available through the Wildlife Commission's Web site (www.ncwildlife.org).

By logging on to the Web site and clicking the "Online Services" link, a visitor can easily perform a number of tasks that previously had to be done either through the mail or in person. Visitors can now choose from the following options:



- Purchase a hunting, fishing and/or trapping license
- Locate a wildlife service agent
- Renew a vessel registration
- Register for a hunter or boater education course
- Purchase a subscription to *Wildlife in North Carolina* magazine
- Change an address for a magazine subscription
- Purchase WILD Store products
- Request an *N.C. Inland Fishing, Hunting and Trapping Regulations Digest* or a game lands map book
- View wildlife, habitat management and fishing publications

Most recently, the Wildlife Commission created a wildlife advisories hotline for hunters, anglers, boaters and outdoors enthusiasts interested in receiving periodic e-mails on wildlife-related topics. The e-mails will be brief announcements covering breaking news from the commission as well as legislative updates related to commission activities. To sign up, visit the link for "Wildlife Updates" on the home page.

Home Sweet Home

A toadfish takes up residence in a part of a ship purposely sunk to create an artificial reef. For more on artificial reefs, see page 24.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

C45
7:67/8

WILDLIFE IN NORTH CAROLINA

AUGUST 2003 $2.50

Fish Whispering

by Jim Dean

JIM DEAN

"Are you, like me, piscatorially challenged?"

We all know (and despise) them. Put simply, they are those fishermen who catch more, and bigger, fish than we do. Some of these people are regular fishing buddies who have been consistently outfishing us for years; others are strangers we encounter by chance. They may be in a boat nearby, standing beside us at the rail of a pier, or sharing a pool while trout are vacuuming furrows through mats of hatching mayflies. The outcome is entirely predictable—these people are thoroughly kicking our angling-obsessed butts.

This syndrome is so pervasive that if it isn't writ somewhere in law, it must have been No. 11 on the tablets Moses carried off the mountain. One particularly virulent subspecies has even become a cliché. The "beginner's luck" clause rules that first-timers, regardless of age, will always outfish their mentors. The more spectacular their ineptitude, the greater the odds are that they will land a lunker bigger than you or I ever dreamed possible.

It makes you wonder if Peter, professional commercial fisherman and patron saint of anglers, somehow missed an important staff meeting. Surely, he would have pointed out how unfair it is to see a lifetime of angling experience and skill eclipsed by some pimply-faced kid with a dip net.

I have spent most of my life—and a goodly portion of my earnings—trying to overcome this disparity. Alas, it has been a futile pursuit. I played my beginner's card more than 50 years ago, and it has become increasingly apparent through the years that I simply don't have the "gift." I am so routinely outfished day-in and day-out that it will take all my willpower not to create a scene when (or if) I meet Saint Pete at the Pearly Gates.

Examples abound. At the family farm I manage, I have worked diligently for 20 years to restore an old cabin and improve the fishing on several ponds. I catch a few bass there occasionally (when I am alone), but every time I invite a companion, I pay the price. Last summer, my friend Jack Avent was standing on the bank while I launched the 12-foot johnboat for an evening of fishing. Unlike me, Jack is a fish whisperer. He walked 20 feet up the bank, made one cast, and caught an 8-pound, 4-ounce largemouth—by far the biggest bass ever taken in any of those ponds. I had not even tied on a lure.

Pete Leo also has the "gift." I stood next to him at the rail of an ocean pier this past year casting for Spanish mackerel. Pete caught fish on nearly every cast. Need I point out who didn't? I borrowed one of his homemade lures. I crowded him, cast to the same spots, turned my reel handle every time he turned his. My supper that night was a Spanish filet broiled in dill, lemon juice and butter. Pete generously donated it.

The last time I took a youngster trout fishing, he caught the biggest brown trout of the trip while his fly was dragging in the water behind him as he walked between pools.

Some years ago, I invited a young lady to go fishing. She had never fished, but thought she might like it. I spent an hour trying to teach her to cast a lure on a spinning rod, but she couldn't get the hang of it. Finally, I tied on a Rebel minnow and suggested that she simply let it drag in the water while I sculled the boat around the pond, casting to likely-looking spots. I hoped to catch a bass so that she would, at least, get to see one.

"Something is pulling on this thing," she said. Moments later, a largemouth the size of a fire-plug cartwheeled out of the water. She cranked that bass in all the way to the rod tip and yanked all six pounds into the boat. "Is that a bass?" she asked.

Does any of this sound familiar? Are you, like me, piscatorially challenged? If so, then I propose that you and I fish my farm ponds together. I think it would be analytically fascinating to see what happens when two irresistible forces are matched against one another. Which of us would catch the most fish? Would neither of us catch anything?

You have to admit that the results could be intriguing. And while we're at it, we might want to put a similar scientific anomaly to the test. Cats always land on their feet, right? And a piece of buttered toast always lands face down. So what would happen if we tie a piece of buttered toast on the back of a cat and toss it out the window of my cabin?

I'll bring the toast and butter; you bring the cat.

N.C. DOCUMENTS CLEARINGHOUSE
AUG 0 5 2003
STATE LIBRARY OF NORTH CAROLINA RALEIGH

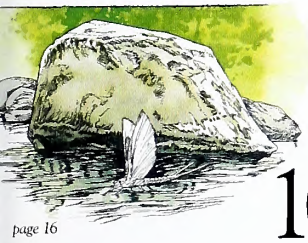
CONTENTS

WILDLIFE IN NORTH CAROLINA

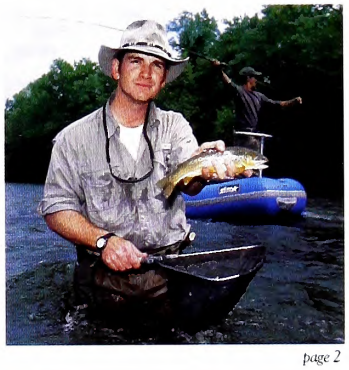
Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

August 2003

Volume 67, Number 8



page 16



page 2

FEATURES

2 **Tale of a Tailrace** *written by Brad Deen*
photographed by Jody Duggins
A new trophy fishery below Lake James is destined to be a trout-fishing treasure.

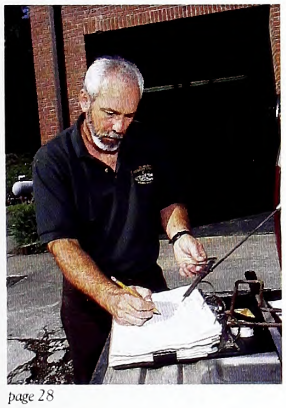
10 **Safe Harbor** *written by John Manuel*
photographed by Jody Duggins
Here, the gift of life is given to injured sea turtles.

16 **Simple Pleasures** *written by Tim Argenziano*
illustrated by Chris Armstrong
Memories of a trip to paradise flow like mountain trout waters.

20 **Wild Places: Caswell Game Land** *written by Chris Powell*
photographed by Jody Duggins
This hunting and fishing area could be the best of its kind in the Piedmont.

24 **Tar Heel Tarpon** *written and photographed by Joel Arrington*
More often associated with the Florida flats, tarpon are making a name for themselves in the Pamlico Sound.

page 20



page 28

DEPARTMENTS

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Greg Jenkins* 28
Back Porch *by Greg Jenkins* 32
N.C. WILD Store 37

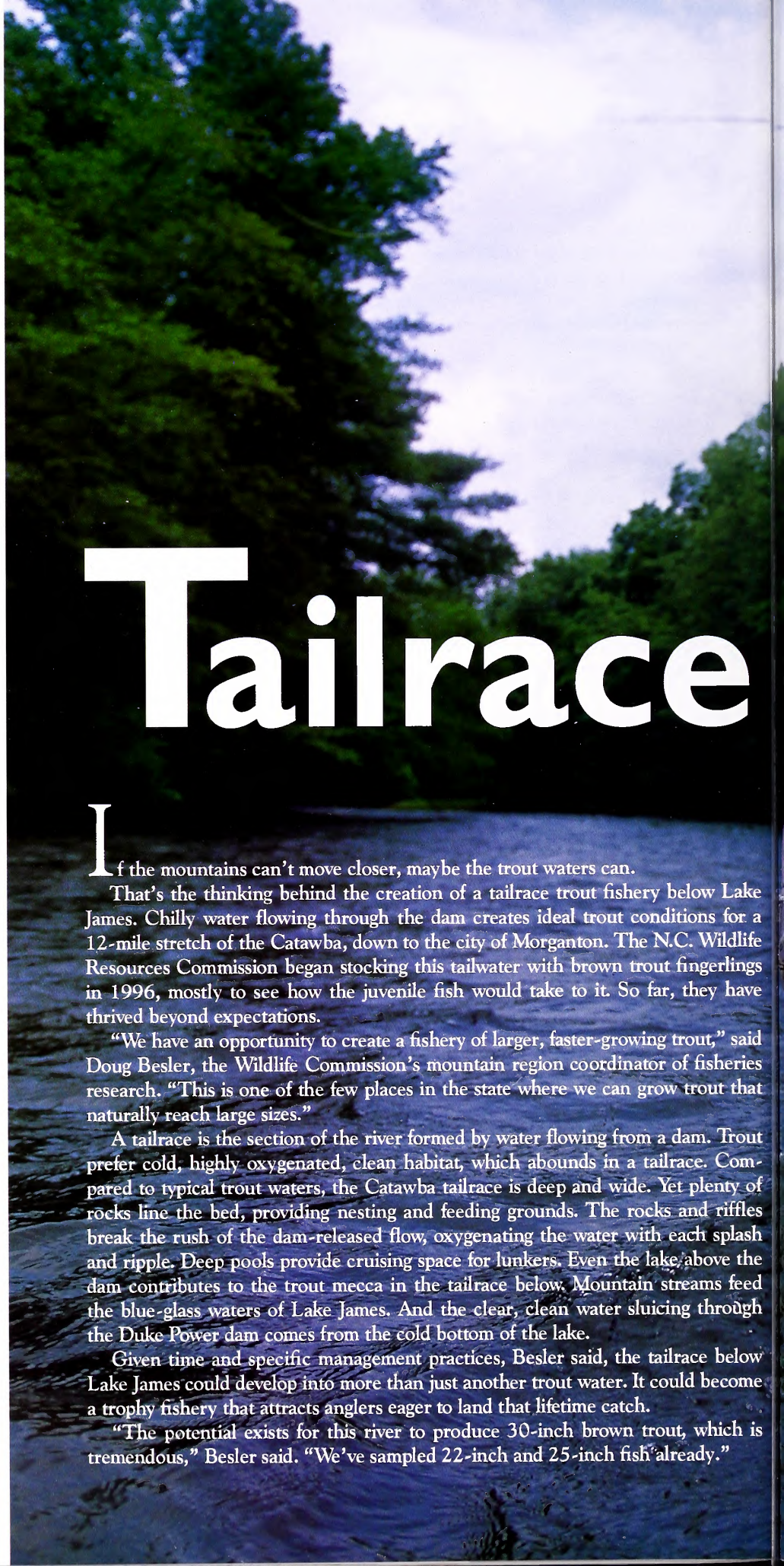
Cover *A sea turtle waits for release. Photograph by Jody Duggins.*

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $12, three years $30, lifetime $150. All foreign subscriptions are $28 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376. **Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.**

tale *of a* Tailrace

A new trophy fishery below Lake James is destined to be a trout-fishing treasure.

written by Brad Deen
photographed by Jody Duggins



If the mountains can't move closer, maybe the trout waters can.

That's the thinking behind the creation of a tailrace trout fishery below Lake James. Chilly water flowing through the dam creates ideal trout conditions for a 12-mile stretch of the Catawba, down to the city of Morganton. The N.C. Wildlife Resources Commission began stocking this tailwater with brown trout fingerlings in 1996, mostly to see how the juvenile fish would take to it. So far, they have thrived beyond expectations.

"We have an opportunity to create a fishery of larger, faster-growing trout," said Doug Besler, the Wildlife Commission's mountain region coordinator of fisheries research. "This is one of the few places in the state where we can grow trout that naturally reach large sizes."

A tailrace is the section of the river formed by water flowing from a dam. Trout prefer cold, highly oxygenated, clean habitat, which abounds in a tailrace. Compared to typical trout waters, the Catawba tailrace is deep and wide. Yet plenty of rocks line the bed, providing nesting and feeding grounds. The rocks and riffles break the rush of the dam-released flow, oxygenating the water with each splash and ripple. Deep pools provide cruising space for lunkers. Even the lake above the dam contributes to the trout mecca in the tailrace below. Mountain streams feed the blue-glass waters of Lake James. And the clear, clean water sluicing through the Duke Power dam comes from the cold bottom of the lake.

Given time and specific management practices, Besler said, the tailrace below Lake James could develop into more than just another trout water. It could become a trophy fishery that attracts anglers eager to land that lifetime catch.

"The potential exists for this river to produce 30-inch brown trout, which is tremendous," Besler said. "We've sampled 22-inch and 25-inch fish already."

***Fishing guide Seth** Vernon shows off a brown trout caught in the tailrace of the Catawba River Dam.*

Tailrace Trout

Among trout anglers, tailraces enjoy a reputation approximating Holy Grail status. But it's a resource North Carolina has lacked.

"Tailrace fisheries are known for their magnetism, if you will," said Squeak Smith, southeast regional vice president of Trout Unlimited. "They grow lots of fish—and good-sized fish. They're an awesome fishing opportunity."

Smith lives in Morganton. So when he wants to fish tailraces, he has to drive to Tennessee, where the Clinch, South Holston and Watauga rivers are interrupted by Tennessee Valley Authority dams. "It's sure going to be nice to have this 8 miles from my door," he said.

Interest from anglers like Smith is what compelled the Wildlife Commission to explore the viability of a trout fishery in the Catawba tailrace. By the mid-1990s, the commission had been stocking the river just below the dam for about 50 years. Those trout were adults, however, and were replenished each spring due to heavy angling pressure. The dam-fed waterway produced very little else in the way of a viable sportfishery.

"Surveys by our biologists and Duke Power showed very little out there," Besler said. The problem, he suspects, was a combination of hydrology and biology. The wide fluctuation of flows, a result of the dam's on-and-off schedule of hydroelectric generation, was not ideal for many native fish species. Besler expects much of the fluctuating-flow issue to resolve as Duke Power seeks federal relicensure of the dam.

Also affecting fish habitat in the tailrace was diminished water quality a mile below the dam, where the clean mountain water suddenly became dirty. Muddy Creek deposits an estimated 25,000 tons of sediment into the basin each year. Where the muddy waters meet the river, the channel runs striped—milky reddish brown in the western half of the river and sparkling clear on the east.

The periodic low flows and sudden dropoff in water quality prevented the development of a trout fishery in the tailrace. In 1994 the commission began stocking it with smallmouth bass, which are somewhat more tolerant of turbid waters. But the lake-fed water proved too cold and the rapid flows too fast for smallies.

"Smallmouth could survive and reproduce there," Besler said, "but it was not what they prefer. They were small. They weren't growing too well in the river. But the brown trout were doing well."

The trout were half-wild fingerlings, which the commission had begun releasing in the tailrace in 1996. A three-year study would assess the viability of brown trout fingerlings stocked at 23 spots along the 12-mile tailrace, from a half-mile below the dam to Morganton's drinking-water intake. The 2000 stocking consisted of 25,000 fingerlings, each tagged with a tiny magnetic wire in its left cheek. The 2001 class of fingerlings were tagged in the right cheek, and 2002 stock in the snout. When biologists sample the river each fall, they wave a handheld device over the fish's head. The detector beeps when it is directly over the tag.

What the biologists learned was surprising. In each year of the three-year study, the hatchery-spawned trout were larger than the wild trout in the same water. After their first summer in the river, hatchery-raised brown trout averaged 1 inch longer than wild browns—7 inches to just under 6 inches. And the size differential remained as fish aged.

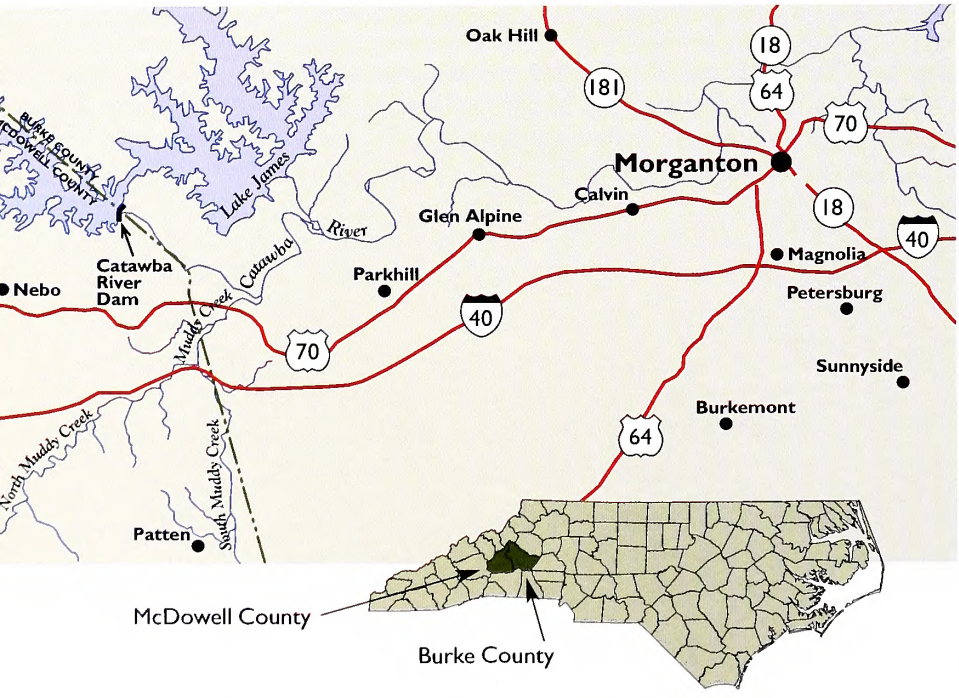
"It's a bit of a mystery," Besler said. "If I had to advance a theory, I'd say that the fish we're stocking are probably bigger than the wild fish at the same age—maybe a half-inch or so bigger. Either that's an advantage when going in, or they develop some advantage. And it appears the difference carries through."

The study also found that the tailrace produced fast-growing fish that increased in length about one-half inch per month during their first two years in the tailrace. Even under optimal conditions in a hatchery, trout grow only a little faster. Curiously, the sampling turned up no downwater dropoff in fish size, which would be a logical assumption as the effects of the dam diminished and the Catawba reverted to a natural river.

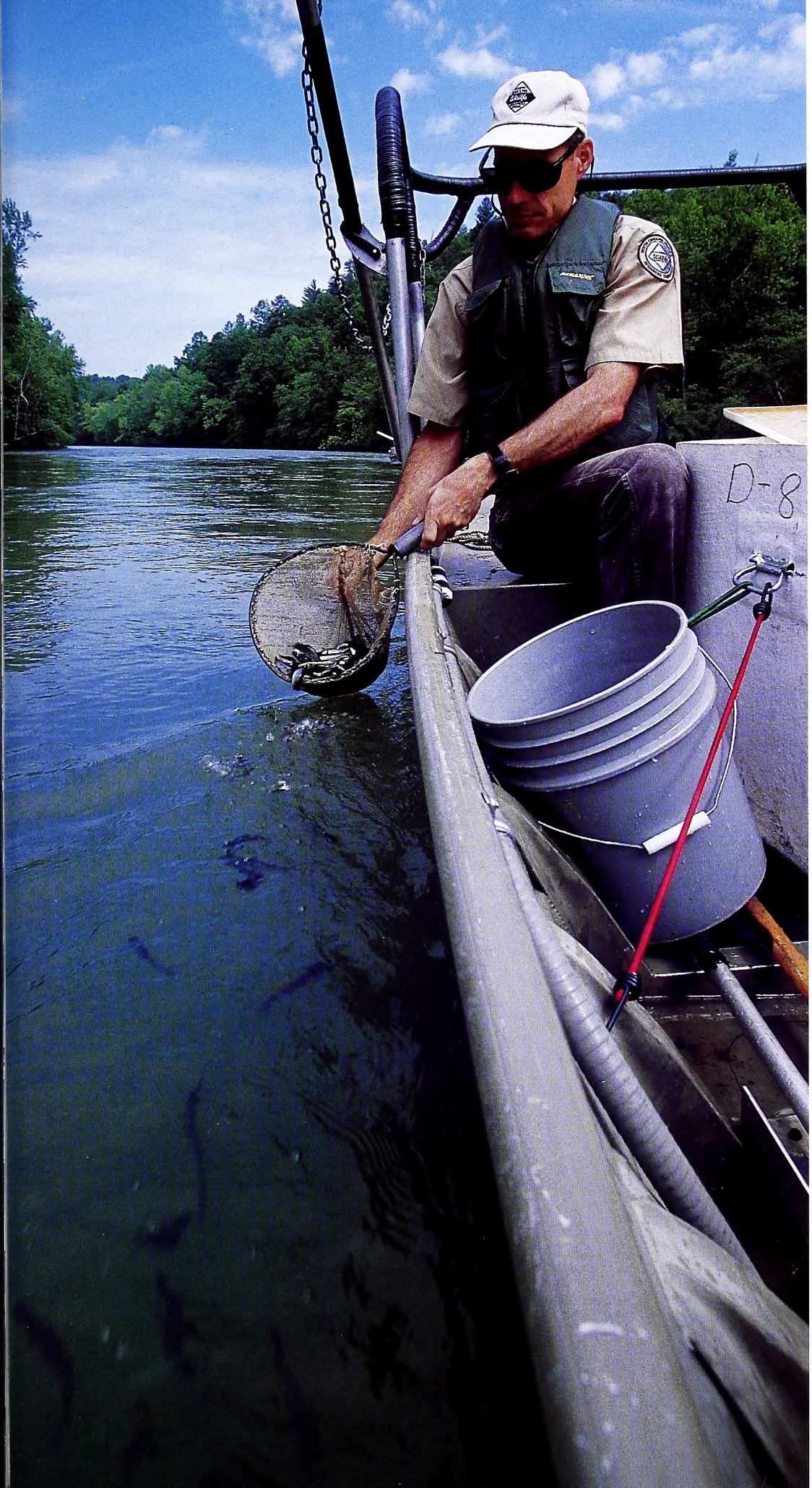
One possible reason for the consistent growth rates, Besler said, is the nutrient load originating in Muddy Creek. Bank erosion, agricultural runoff, land-disturbing developments and the town

***Muddy Creek** creates a striped pattern as it flows into the Catawba. Landowners and scientists are taking steps to reduce the creek's sediment load.*

Lake James and Tailrace



Biologists hope to enhance trout populations in the Catawba tailrace—the portion of the river just below the dam on Lake James. Work has also begun to clean up Muddy Creek, which leads into the Catawba River.



At left, *wildlife biologists stock the tailrace with hatchery-raised fingerling brown trout. Above, juvenile trout are implanted with a tiny stainless-steel chip for monitoring purposes.*

of Marion's sewage treatment plant all discharge into Muddy Creek. A trickle-up effect occurs, as more microscopic organisms and plants take advantage of the heightened nutrient-rich waters. That bumps up the number of insects and other small animals, which in turn leads to an increase in the number and size of fish.

"A typical mountain trout stream has very low natural productivity, so consequently, we see very slow growth rates and very few trout over 10 inches," Besler said. "The productivity of this tailrace is in an order of magnitude higher than you would see in a normal trout stream."

But the sediment that supercharges the tailrace biosphere also increases the turbidity of the water, making it increasingly unsuitable for trout. "Muddy Creek is a double-edged sword," Besler said.

De-Muddying Muddy Creek

The mud of Muddy Creek could hamper the developing fishery. As more and more of the floodplain winds up in the water, the sediment covers nesting and feeding areas on the river's bottom.

Agriculture is one culprit—a combination of cattle trampling the streambanks to reach water, and field runoff containing fertilizers and other pollutants. Construction in the 98-square-mile Muddy Creek watershed also sends hundreds of tons of red mud into the stream annually. A short canoe jaunt down the creek reveals dozens of spots where streambank erosion has created mini Grand Canyons towering 12 to 15 feet above the water's surface.

"There's just a tremendous sediment load, and it affects the whole watershed," said Bob Brown, an assistant district fish biologist for the Wildlife Commission. "We've spent the last five years working with a lot of different partners to see what we could do."

From Duke Power, which owns much of the Upper Catawba watershed, to Trout Unlimited, which has donated thousands of dollars and volunteer hours, assistance in cleaning Muddy Creek has come from the public, private and nonprofit sectors. An umbrella organization, Muddy Creek Partners, focuses many of these efforts.

"We've raised more than $1 million in the last five years," said Andy Brown, project coordinator for Muddy Creek Partners, "and three-fourths of that has gone toward on-the-ground restoration projects."

What stream restorers focus on are streambank stabilization and revegetation. "We work with landowners to keep their land from washing away," Brown said. "We've restored 6,500 feet of stream and surrounding banks. And exclusive of that, we've revegetated more than 1 mile of stream frontage. That's close to 20,000 feet of restoration, total."

Erosion-proofing methods vary by site. They range from fencing cattle out of the streams and drilling a well to water them, to excavating

***The Catawba Dam** tailrace could soon become a trophy trout fishery that attracts anglers from far and near.*

JEREMY GRADY

high-walled, erosion-prone banks with heavy machinery. At times, rock structures called "vanes" are the appropriate solution. These low rock walls have two purposes: They deflect water from particularly vulnerable banks, and, as the crevices fill with mud and silt, they form new, gently sloping streambanks.

Brown estimates the cleanup of Muddy Creek will take another 10 years or more. Landowner cooperation is key. "We've got to have them on board and participating to achieve an acceptable level of watershed protection," he said.

***Wildlife biologists** use an electrofishing rig to temporarily stun fish so they can measure them and document how much each hatchery year-class has grown.*

To sweeten their offer to landowners, the Muddy Creek Partners offer to remove invasive exotic plants, such as multiflora rose and Japanese knotweed, which have established themselves as tenacious weeds that thrive in disturbed streamsides.

"Doing this, and revegetating the floodplain area with attractive native plants, has a high aesthetic appeal. We want the landowners to see the value of maintaining a riparian forest buffer," Brown said.

'Green Dollars'

The value could be economic, as well.

Smith of Trout Unlimited said communities that boast tailrace fisheries "make millions and millions of dollars. If you build 'em, they will come."

A recent survey of tailrace anglers by the Tennessee Valley Authority found that each fisherman spent an average of $117 per day in pursuit of elusive tailrace trout. Multiply that by tens of thousands of anglers each year, and the economic impacts are considerable.

"The thing is, those are green dollars," Smith said. "You don't have to build infrastructure. You don't have to build new schools. I'm sure people in Charlotte, in Raleigh, would rather drive here than to Tennessee. People go there, or to Arkansas or out West and spend thousands of dollars for the same experience we're trying to provide right here in our backyard."

There are additional economic benefits to be reaped, said Brown of Muddy Creek Partners. Participation in land stabilization programs would make landowners in McDowell and Burke counties eligible for a share of $450,000 each year from federal and state farm programs. And the city of Morganton, he said, probably would not have to spend as much money filtering upstream sediment out of its drinking water.

That's all a little premature for the fish biologists, who have launched a follow-up study to determine the optimal stocking numbers and patterns to create a population of trophy-sized brown trout. Biologists also hope to have a set of proposed regulations for the tailrace available for review next year. Currently, the tailrace falls under the same regulations as other hatchery-supported trout streams across the state—an open season every month of the year except March, a daily creel of seven and no size or lure restrictions. Refer to the *2003–2004 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest* for exact dates.

One thing is certain. When the commission makes rules for the tailrace, the primary consideration will be the local residents who enjoy fishing the Catawba just as it is. Creating a fishing opportunity for out-of-state trout anglers is secondary. "Our goal here is, primarily, to provide a brown trout resource," Besler said. "Our secondary goal [is to] produce a trophy trout resource."

Toward that end, the commission is working with Duke Power during its dam relicensure effort to ensure that anglers—including anglers with disabilities—have improved access to streamside fishing in the tailrace.

Besler said the commission will continue stocking the tailrace with brown trout, at least for the foreseeable future. Recent sampling of the fish has turned up signs of some natural reproduction, but for now the rate is too slow to perpetuate the trout fishery.

"We don't have a goal of creating a natural fishery, a naturally reproducing resource. Under certain conditions, at some future date, maybe," he said. "If someone wants to fish in a natural trout stream, we have over 5,000 miles of them here in North Carolina."

But this one should be special—a jewel that anglers from North Carolina, neighboring states and even farther away will be thrilled to fish. Not that it will reach that level this year, or even the next. Five years or longer is the consensus timeline for pulling trophy trout out of the Catawba.

"It's coming," said Smith, "and it'll be great. But it's not there yet." ⊠

JEREMY GRADY

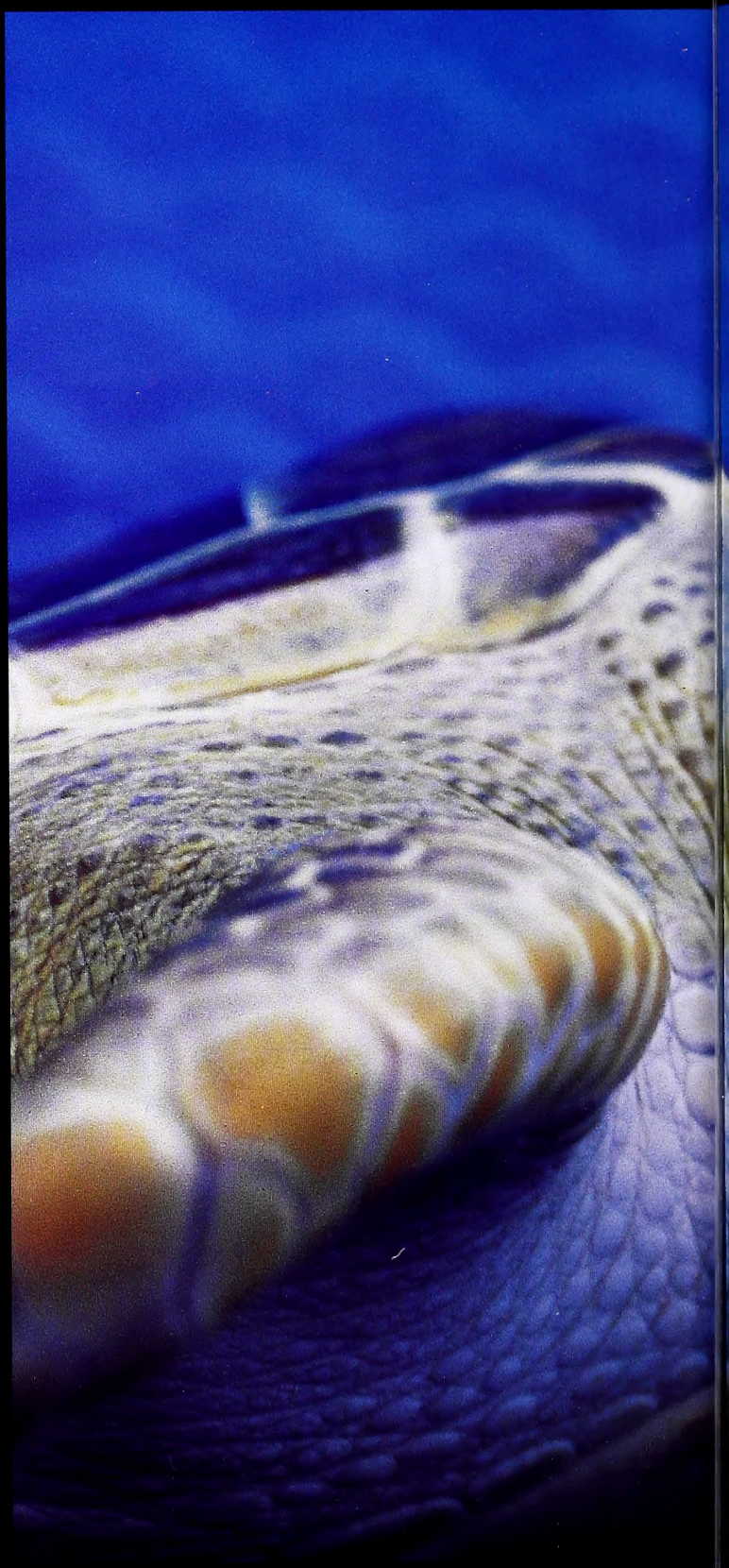
Five years or longer is the consensus timeline for pulling trophy trout out of the Catawba.

***Because the tailrace** has the potential to produce trout upwards of 25 inches, beauties like this one are only the beginning.*

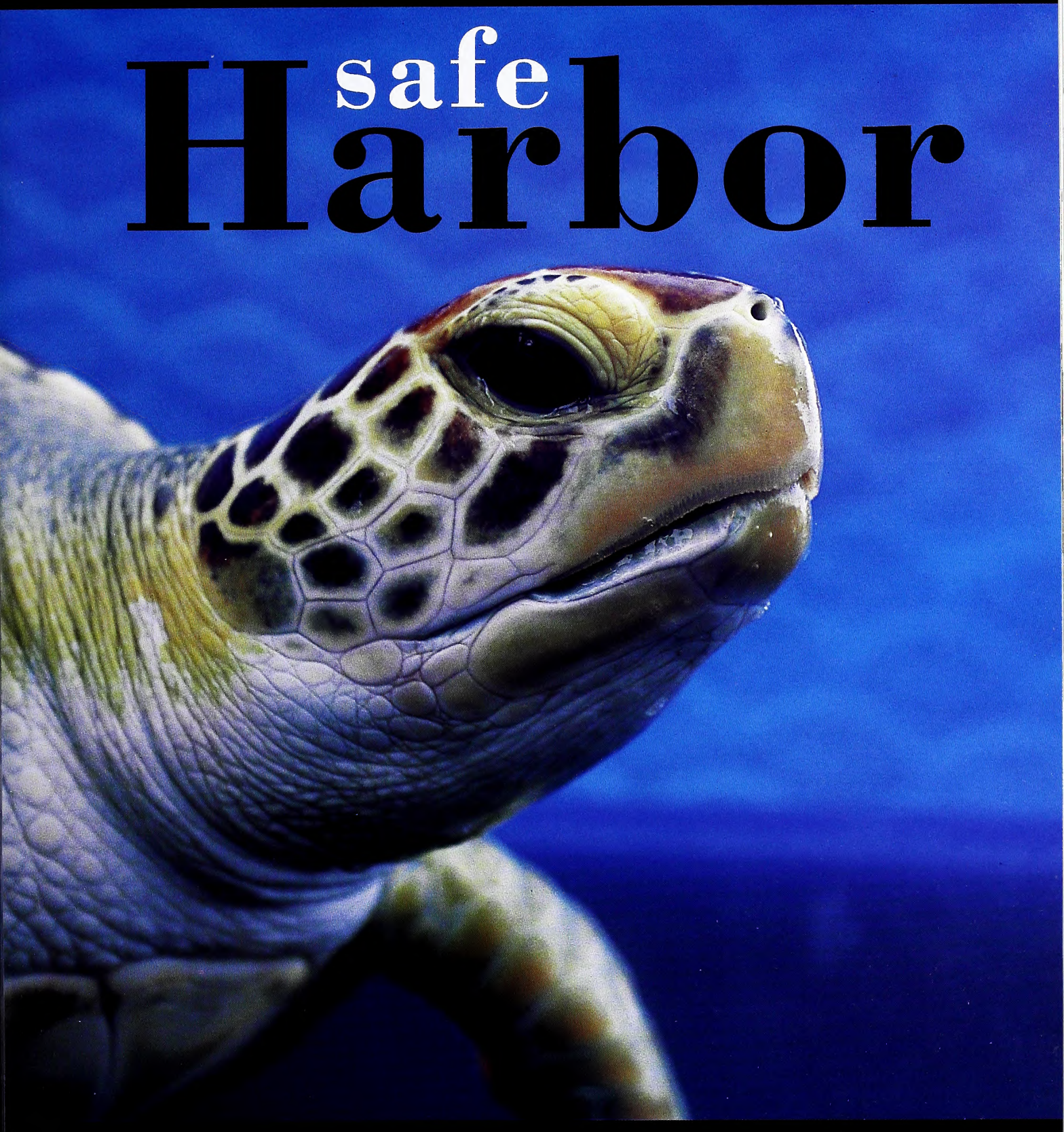
HERE, THE GIFT OF LIFE IS GIVEN TO INJURED SEA TURTLES.

written by John Manuel
photographed by Jody Duggins

They come from all over the Southeast—loggerheads, greens and Kemp's ridleys. Some are as small as dinner plates, others as big as tabletops. Their injuries run the gamut from cracked shells and severed limbs to infections so severe their flesh is literally falling off. Many arrive at death's door, eyes dull, unwilling to eat. But once the sea turtles come under the care of the volunteers at the Karen Beasley Sea Turtle Rescue and Rehabilitation Center in Topsail Beach, their chances of recovery are good. Cuts will be sewn up, infections treated with antibiotics, and broken shells given time to heal. If all goes well, the turtles will be returned to the wild to live long and productive lives.



safe Harbor



At left, volunteer *Krystal Noiseaux cleans wounds on a loggerhead turtle's carapace. After several months of tender loving care, sick and injured sea turtles usually look like the healthy specimen above and are ready for release back into the ocean.*

For its grandiose title, the Sea Turtle Rescue and Rehabilitation Center couldn't be more humble in appearance. The center is housed in an unadorned, 1,000-square-foot building tucked between townhomes and a bungalow on the sound side of Topsail Island. Inside, the facility is crammed with circular polyethylene holding tanks, deeper but no wider than a child's wading pool. The turtles float or swim inside their tanks, raising their heads now and then to take a breath or stare at their human caretakers.

"People need to understand this is not a museum or aquarium," says director Jean Beasley. "We have no turtles on display. Our only mission is to bring the turtles back to health and release them to the wild."

One of only two facilities on the East Coast focused exclusively on treating sea turtles, the Beasley Center cares for all of the species commonly found in the southern Atlantic. Loggerheads (*Caretta caretta*) comprise the greatest number, followed by greens (*Chelonia mydas*) and Kemp's ridleys (*Leidochelys kempi*). The former two species are considered threatened, and Kemp's ridleys are listed as endangered.

***N.C. Wildlife Resources** Commission biologist Wendy Cluse (center) helps center director Jean Beasley clean barnacles off a new patient's shell.*

TAKING TURTLES IN The turtles brought to the center range in weight from 5 or 10 pounds to as much as 350 pounds. Most are juveniles. A few suffer from naturally induced injuries such as shark bites, but most are there as a result of collisions with motorboats, entanglement in fishing nets and monofilament line, ingestion of fishing hooks or exposure to pollution and neurotoxins.

Upon being admitted to the center, turtles undergo a health assessment according to a standard protocol developed by the N.C. State University School of Veterinary Medicine. Volunteer staff thoroughly examines all body parts for injury or infection. If they need immediate surgery, the turtles are transported to the vet school in Raleigh. Otherwise, they are cleaned up and put into the holding tanks to undergo a regimen of treatment specific to their illnesses or injuries.

The maintenance of sea turtles over a period of months or years is no simple task. That's one reason no similar hospitals exist along the coast. The water in the tanks must be constantly refreshed, which is accomplished by pumping water directly from Topsail Sound. In winter, tank water is heated to tropical or subtropical temperatures. The turtles are fed a diet of fish and squid, some procured from local seafood houses, some donated by recreational fishermen. "We have two volunteers who go up and down the piers with coolers asking for donations of fish," Beasley says. "People are usually happy to give."

Every day, the tanks must be drained, cleaned and sanitized. While this is being done, the turtles are given a bath in an antibacterial solution. All this is accomplished by an average of five volunteers. Each of the turtles is given a name related to the nature of its injury or the place or circumstance under which it was found. Sharkey suffered from shark bites. Charleston was brought up from Charleston, S.C. Naming is done for practical as well as personal reasons. "We use a lot of volunteers, some of whom are here only twice a month," Beasley says. "It's a lot easier to say, 'Go clean Sharkey's tank' than to say, 'Clean out number RD14.'"

Turtles are held only as long as necessary for them to recover sufficiently to return to the wild. That may be a matter of months or as long as three years. Over that time, caregivers and patients develop close bonds.

"We try very hard not to make pets out of the turtles, but many of them need a good deal of nurturing," Beasley says. "Some come here so weak or traumatized that they literally lack the will to live. We've got to convince them to care, to know that they are safe. We do that by talking to them, by scratching their backs. They are very responsive to human kindness."

Beasley says the turtles come to recognize individual caretakers. "There may be six or eight people standing around a tank, and they will go to the person that normally cares for them," she says. "When we have them out on the table treating wounds, they will be calm if the regular volunteers are there, but they will thrash around with the new people."

PARTING WAVES Eventually, the time comes when man and turtle must part ways. Turtles scheduled for release are first transferred to outdoor tanks, where the smell of the sea and the sight of the sky seem to revive their natural instincts. The turtles thrash around in their tanks, eager to return to the wild. If a stranger approaches, they may dive to the bottom of the tank in an attempt to escape.

On release day, the turtles are transferred by truck to the beach. The center typically invites local school groups and interested biology students to attend. Beasley used to advertise release days to the public but stopped doing so when the crowds grew to the thousands and people started getting in the way of the release efforts. "We've had some people swim after the turtles and try to grab them," Beasley says. "We're happy to have people witness the event, but when they bother the turtles, we have to draw the line."

While volunteers keep the crowds at bay, the turtles are carried down to the water. They are set into the waves and invariably start swimming toward the open ocean as soon as they feel the tug of the currents. Tears are shed amongst the staffers who have cared for the turtles. But only when the reptiles have disappeared back into the deep can the center say its mission has been accomplished.

For all the center's popularity, it's fair to ask whether or not the turtles treated and released by the center are able to survive in the wild. After the oil spill of the *Exxon Valdese* in Alaska, volunteers spent an enormous amount of time and money cleaning and caring for waterfowl. But studies indicated that relatively few of those birds survived for long after being returned to the wild.

The only information available on turtles released from the Beasley Center is anecdotal, but it is positive. Prior to their release, turtles are

Instead of beds, the turtle hospital *is full of blue, plastic tanks that house specimens such as the injured loggerhead below, which had to have cracks in its carapace secured with metal plates and screws.*

Beasley addresses *volunteers before the most rewarding day of the year for those involved—the release of rehabilitated turtles back into the sea.*

fitted with internal and external tags that allow them to be identified if they are later captured or stranded. Of the more than 100 turtles treated and released since 1996, only three have been found dead. Several have been spotted in good health at sea by divers and boaters. One has returned to nest.

One of the difficulties in tracking turtles released by the center is that most are juveniles, primarily 5-to-15-year-old loggerheads. Male loggerheads never return to land, and females return only to nest, a practice they would follow only after reaching sexual maturity at 15 to 30 years of age. The N.C. Wildlife Resources Commission hopes to obtain funding to put satellite transmitters on the turtles to help track them after their release, but unless and until that occurs, no one really knows what happens to most of them.

***Sometimes, volunteer** nurses and their patients become quite close during the turtles' time at the hospital.*

VOLUNTEER NURSES As for the quality of care that the turtles receive at the center, experts say it is top-notch. Greg Lewbart is assistant professor of aquatic medicine at the N.C. State University College of Veterinary Medicine. He has worked with the facility since its opening.

"The center staff is the most amazing group of volunteers I have ever worked with," Lewbart says. "We do the surgical and emergency work up here, but they do everything else. They have developed state-of-the-art nursing techniques and have even coauthored some studies on the treatment of injured sea turtles."

Alvin Braswell, curator of herpetology at the N.C. Museum of Natural Sciences, says the center's contribution is manifold. "There is the hospital itself, which contributes to the survival of individual turtles," Braswell says. "In addition, the center does an excellent job of public education, getting people involved in protecting nest sites, going out and speaking to school groups, and generating news stories that promote awareness about sea turtles. Together, these programs can have a substantial impact."

The Beasley Center is named in honor of Karen Beasley, Jean's daughter and one of the pioneers of sea turtle protection on the North Carolina coast. In the late 1980s, Karen organized the Topsail Turtle Project, a volunteer effort to walk the beaches of Topsail Island to locate and protect sea turtle nests. Hundreds of nest sites were protected and thousands of hatchlings were ushered safely into the ocean through Karen's efforts. Tragically, she contracted leukemia and died in 1991.

Jean and other volunteers kept the project alive in the years following Karen's death. They had no plans to open a hospital but were prompted to do so when an injured turtle washed up on Topsail Beach. A volunteer arranged to put the turtle, dubbed Lucky, in a tank in his backyard, pumping water in from the nearby sound.

Word spread of the volunteers' success in keeping Lucky alive, and soon other people were approaching the organization to care for injured turtles. Using money from Karen's life insurance policy and from the Beasley family, the Turtle Project built a facility on Carolina Boulevard. At that point, the organization established a separate board of directors for the center and the Turtle Project.

Today, the center is supported solely through donations, primarily from people who have learned of the hospital while on vacation at Topsail Beach. The staff is all volunteers, drawn from the ranks of retirees, vacationers, college students and high school students. (The center has a junior biologist program taking students starting at age 13.) Beasley says that entire families sometimes devote their vacations to working at the center.

The center is open for visitation during the summer, though visitors are limited to viewing the outdoor tanks holding turtles scheduled for release. Hours are from 2 to 4 p.m. on Mondays, Tuesdays, Thursdays, Fridays and Saturdays. Waiting lines frequently stretch for several blocks, so visitors should come prepared with water, snacks and hats.

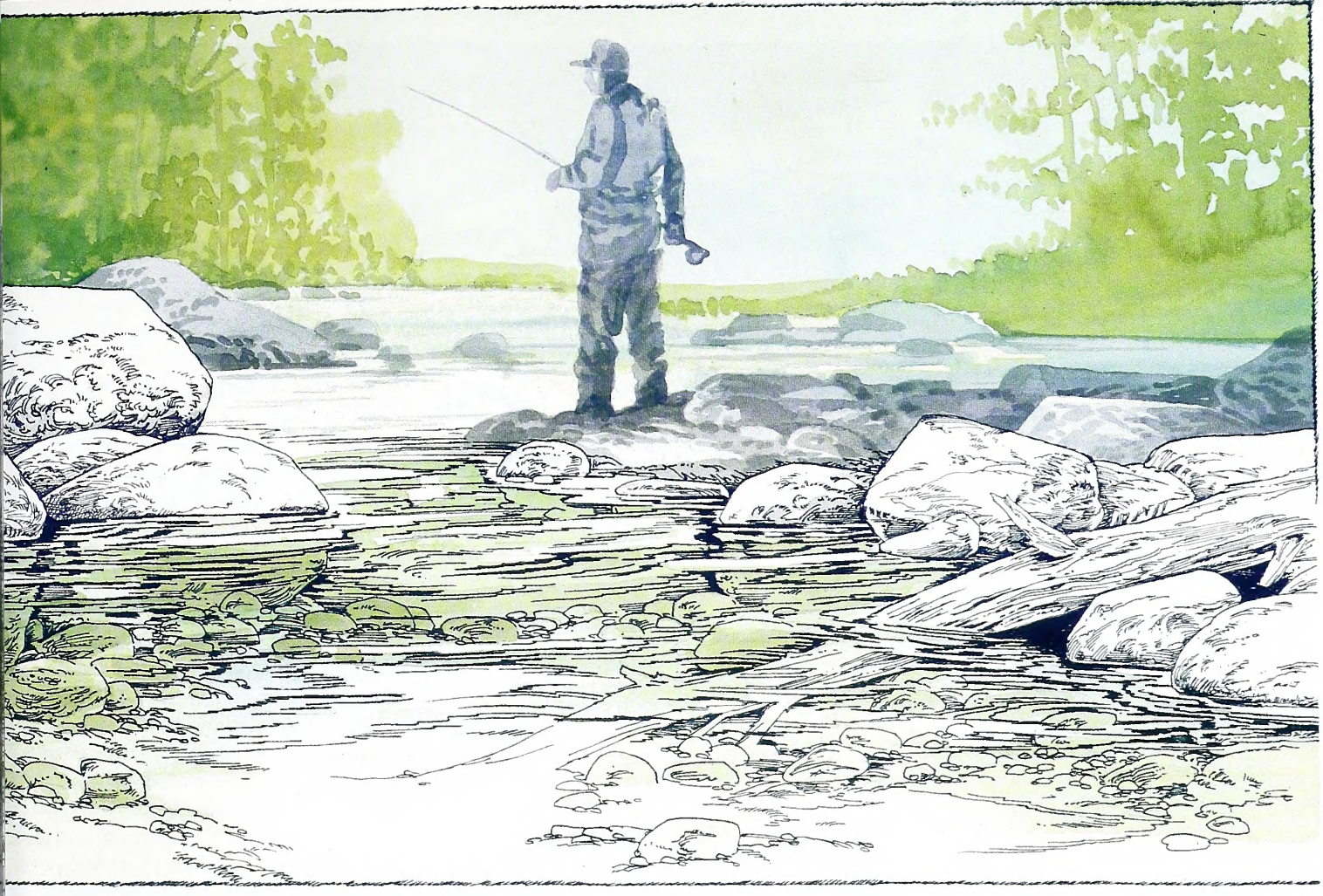
Information on the center is available through its Web site at www.seaturtlehospital.org. ⊠

Simple Pleasures

❖❖❖

Memories of a trip to paradise flow like mountain trout waters.

written by Tim Argenziano illustrated by Chris Armstrong



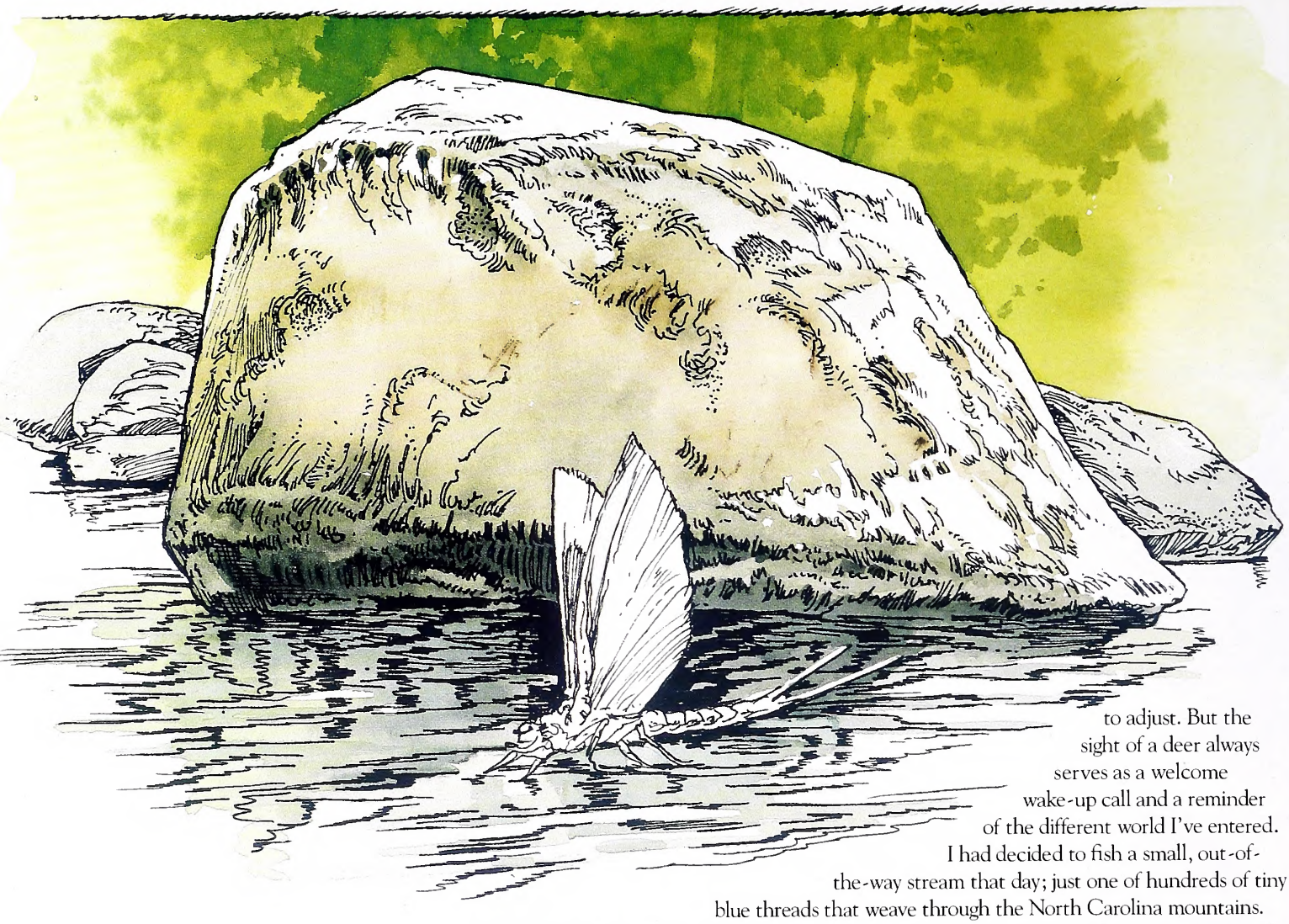
As I traveled down the winding, dusty road, my excitement for a quiet and long-overdue day on the water grew stronger at every curve. My destination was a favorite little trout stream tucked away deep in the Blue Ridge Mountains. Though I hadn't been there in quite a while, I recognized the small landmarks that told me I was getting close to the trailhead leading to the creek. When I finally reached it, I almost drove right by. The once-obvious hole in the forest wall had nearly filled in with brush, looking like it hadn't seen much traffic recently.

Though I really didn't expect to see anyone else there, I was still relieved to find I was alone in the crisp, clean-smelling air, the kind that you can find only on an early morning in the mountains. Other aromas also made it clear I had entered the woods: pine needles and wildflowers. Does running water have a scent? Sometimes I'd swear it does, though I couldn't describe it. Maybe the sensory overload of such a place was just playing tricks on the parts of my brain that had been lulled to sleep by city life.

I quickly strung up my rod, loaded lunch into a pack, stuffed a small flybox in my pocket and set off down the overgrown trail. I walked downstream along the creek and watched closely for signs of life: a fluttering mayfly or preferably several small, cigar-shaped shadows holding in the current or darting away when sensing my clumsy approach. The thick brush on the trail slowly began to give way, and when I rounded a bend in the creek, I spotted a family of deer enjoying the dew-soaked grass in a small clearing. I stopped to watch, but they all heard me coming and lifted their heads. After a few indecisive seconds, one of them bounded away and was soon followed by the others.

Though I really didn't expect to see anyone else there, I was still relieved to find I was alone in the crisp, clean-smelling air.

I continued along the creek with a new sensitivity to my surroundings. For me, a trip to the woods represents a day so unlike my normal one that sometimes it takes a while for my brain



to adjust. But the sight of a deer always serves as a welcome wake-up call and a reminder of the different world I've entered. I had decided to fish a small, out-of-the-way stream that day; just one of hundreds of tiny blue threads that weave through the North Carolina mountains. Some of them are too small even to have names or show up on a map. This one, at least, had a name and a road that passed nearby. But it was not nearly as famous and popular as some of the larger rivers in the state—the ones that have bigger trout, noisy campgrounds and anglers in every pool. The shallow, clear waters of this particular creek were filled with trout that compensated for their lack of size with aggressive strikes and a seeming innocence. It was harder to reach than other streams, but its rewards were greater. I knew I could probably fish the whole day without seeing another soul, which was reward enough.

The quest for fat, photo-worthy trout had led me to forget temporarily why I fell in love with trout fishing in the first place. Trout live in beautiful places: clear, rushing streams in quiet mountain forests. Spending a day fly-fishing for trout means spending a day surrounded by nature and drowning in relaxation. It means that the mind drifts away from stressful thoughts of bills, work and responsibilities, focusing instead on the rhythm of the cast, the drift of the fly and the constant hope of what the next cast may bring. Catching a fish is merely the icing on the cake of a trout-fishing experience.

As I walked along that stream with rod in hand, the urge to fish grew unbearable, and I could go no further.

As I walked along that stream with rod in hand, the urge to fish grew unbearable, and I could go no further. I finally waded in and studied the water with an unnecessary intensity, having forgotten for a moment where I was. The holding areas and feeding lanes on the small creek were easy to spot, and there would likely be a hungry trout in every one of them. This was not a place that would test my angling skills, and that was just fine with me. I soon spotted the first trout in the tail of a pool just upstream. When my fly made its first appearance in the pool, the trout didn't wait for it to reach him. He raced toward it with no hesitation, as if needing to beat out some competitor that I didn't see. I lifted the rod, and he put up more fight than I expected from his 7-inch body. I quickly brought him to hand

without even using the reel, and paused to admire his markings. There seemed almost to be a look of surprise in his eyes, and in my hand he felt strong and helpless at the same time. When I released him in the cold water, he immediately flipped free of my grip and fled to the safety of a nearby rock. I wondered how long it would be until he forgot and once again rose to a meal floating over his head.

❖ ❖ ❖

After a long morning of fishing, I found a place on the mossy bank for a lunch of peanut butter sandwiches and warm soda. Lunch is one of my favorite parts of a day on the stream, a time to sit back and soak in the environment without being distracted by casts, snags, thorn bushes and slippery rocks. It's hard to imagine any sight or sound more relaxing than that of a tumbling mountain stream. While eating, I spotted another fish in the pool above, not far from the bank, and thought he would be the first challenge after lunch.

Then a squirrel bounded down a nearby tree and made his way toward the bank. The little trout, not knowing the difference between the blurry outline of a harmless squirrel and that of a dangerous raccoon, disappeared into the black depths of the pool. The squirrel didn't notice all the trouble it had caused, and quickly continued to the water's edge. It looked as though it might jump in, but instead just reached its head down and took a drink. At that moment, watching that simple drama play out before me, I felt completely content. There was no other place I wanted to be. I remember thinking how wasteful it seemed to spend a life surrounded by computers and concrete when there are such rewarding alternatives.

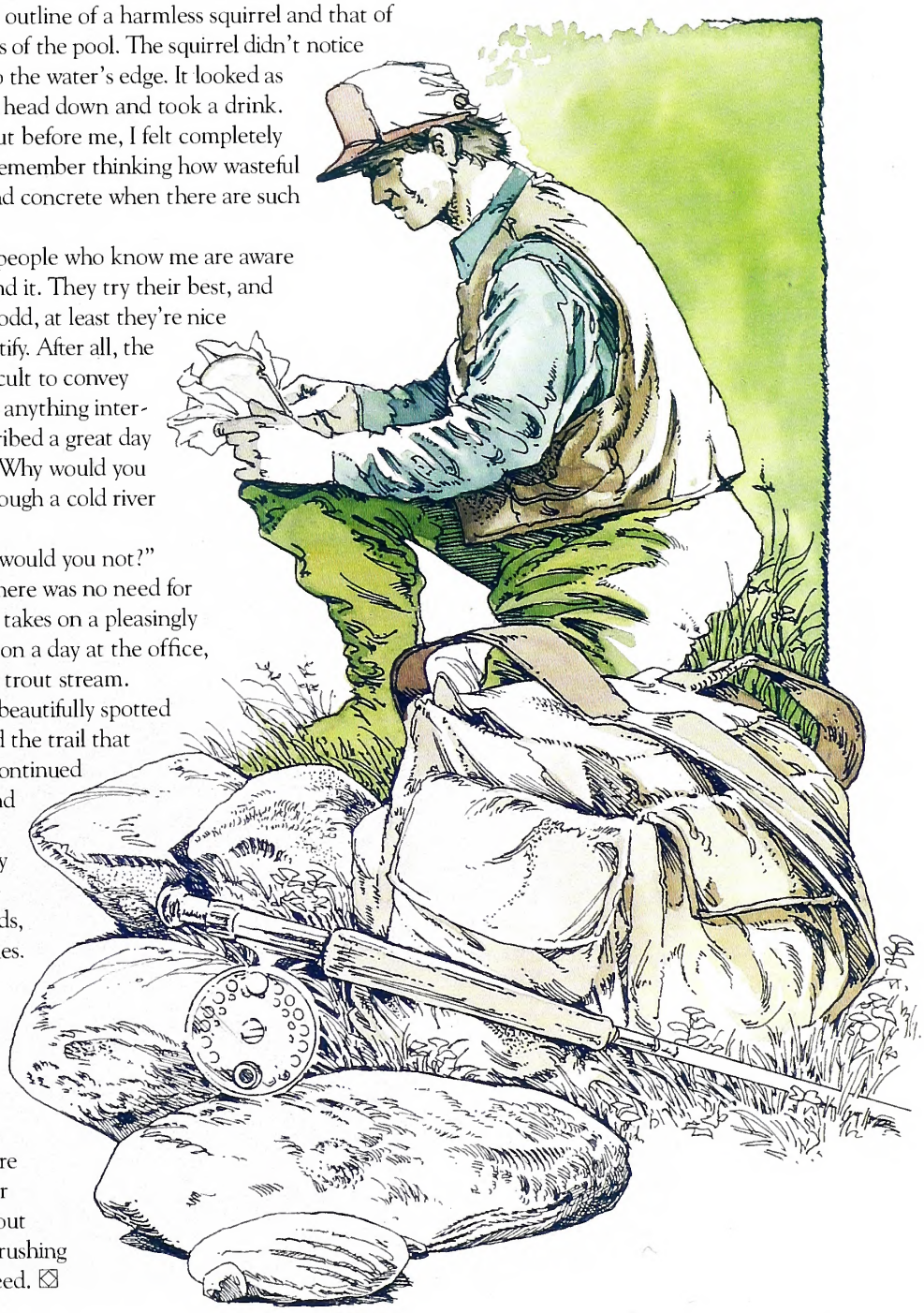
In the city, where I spend most of my time, those people who know me are aware of my love for fly-fishing. But few can truly understand it. They try their best, and if they do think that my obsession with trout is a little odd, at least they're nice enough not to say so. I understand if people can't identify. After all, the true benefits of a day on a mountain stream are difficult to convey with words. Recently, a friend asked me if I had done anything interesting over the previous weekend. After I briefly described a great day of fishing, my friend clearly didn't get it and asked, "Why would you want to spend a whole day in the woods, walking through a cold river all by yourself?"

The only response that came to mind was, "Why would you not?"

On that day, sitting on the bank of that stream, there was no need for explanations. Priorities change in the woods, and life takes on a pleasingly different pace and perspective. For one thing, unlike on a day at the office, I never look forward to time's passing when I'm on a trout stream.

I finished lunch and spent the afternoon catching beautifully spotted trout in all the places they should be. When I reached the trail that led to the car, I was having too much fun to quit and continued on a little further. Finally, I knew I had to get back and start the drive home. Walking up the trail, the inevitable depression that accompanies the end to any perfect day on the water started to set in. It's understandable, since I was on my way back to traffic, crowds, exhaust fumes and an office filled with noisy telephones.

Driving home, I relived the day in my mind and tried to remember each trout I was lucky enough to catch. I promised myself I would be back sooner next time. Then I thought about how lucky I am. After all, some people travel all around the world in search of paradise, looking for that one special place that gives them fulfillment and happiness. But there are a lucky few of us who were raised, or learned on their own, to appreciate the beauty and perfection of a trout stream. Anyplace where mountains, forests and clear, rushing water come together is the only paradise we'll ever need. ⊠



WILD PLACES

Caswell Game Land: Hidden Gem

written by CHRIS POWELL

photographed by JODY DUGGINS

This hunting and fishing area could be the best of its kind in the Piedmont.

Imagine for a moment the perfect landscape for producing wildlife. Start with a 16,700-acre blank canvas in the Piedmont, and paint in hills and gullies with a mature oak-hickory forest that produces large quantities of mast. Now dab the image with several hundred acres of crop fields—tiny 1/4- to 10-acre farms that, combined, add up to miles of semi-secluded edge habitat. Then transect the painting with numerous small streams and a couple of ponds. Next, brush in a fruit orchard here and there. Finally, to this masterpiece add a crew of people dedicated to maximizing the wildlife-producing capabilities of the land.

Combine all of those features and more, and you have the Caswell Game Land. Located in the northern Piedmont county of Caswell, near the town of Yanceyville, the game land is unique in that it lies relatively close to major urban population centers such as Greensboro and Raleigh but does not have development pushing in from all sides. In fact, that portion of the state is still fairly remote.

Another interesting aspect is the topography of the Caswell area. Though located in the Piedmont (known for gently rolling hills), the game land has steep hills and deep ravines more typical of mountainous regions. David C. Clapp, soil survey party leader for Caswell County, said the exaggerated relief is due to erosion, but no definitive reason for such massive soil displacement has been identified. "Our speculation is that this would be due to a very long, geological-age period of erosion," Clapp said. "There may have been some geological form that held the landscape up on a plain for many years. When the erosion process started, the erosion was by gully erosion and not sheet or rill erosion. There is nothing in the geology to indicate why this particular area eroded so deeply. There are broad, smooth landscapes in surrounding counties, and even in Caswell County, that have the same soils and underlying geology."

Ironically, the presence of highly erodible soil is what ultimately saved the land. During the Great Depression, farmers couldn't make a living there, and the federal government either bought the land or assumed it when taxes could not be paid. "The U.S. Forest Service eventually wound up with it," said Danny Ray, lead wildlife technician for Caswell, "and they owned it for several years up to 1959. That's when the Wildlife Commission purchased it."

And what was worthless for farming became a gem for wildlife. The game land is made up of more than 100 smaller tracts that, through modern no-till farming, are still kept in production. The importance of these crop areas to the game land cannot be overstated. Around every corner, on top of every bluff, in every gully is one of these tiny fields. It's like having a perfect little tucked-away hunting area everywhere you turn. Wildlife species, especially deer and turkeys, can easily traverse the hardwoods and cutovers as they move to and from these areas. What's more, a third of these fields are rented to local farmers who are allowed to farm them, provided the crop

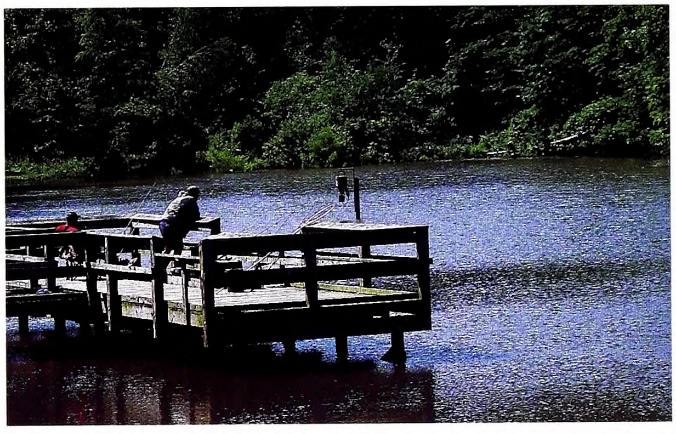
***Open fields** (facing page) and carefully managed woodlands (left) are typical of the scenery found in the Caswell Game Land.*

is wildlife-friendly and 10 percent of each harvest is left for wildlife. The Caswell Game Land crew plants the remaining fields. Crops include chufa, corn, sunflowers, proso millet, browntop millet, buckwheat, sorghum and Japanese millet.

"We have about 800 acres of fields total," Ray said. "We lease out a little over 300 acres to private individuals. It would be impossible for the Wildlife Commission crew to manage a full 800 acres with all of our other responsibilities. Renting the fields takes 300 acres out of our hands and assures that they will still be maintained for wildlife."

Unlike some game lands that are vast single pieces of land, Caswell is divided up into 11 different tracts. So instead of having remote sections that are practically impossible to hunt, all of Caswell is accessible. "Foot traffic is encouraged, but no motor vehicles are allowed, except on a few seasonal roads," Ray said. "So there is a lot of opportunity to walk several miles of roads and fire lines that do not have vehicular access."

However, that rule does not apply to physically challenged hunters using the handicapped-accessible areas. Provided they have a Wildlife Commission permit, a physically challenged hunter and a partner can drive a motorized vehicle into two access areas. The roads are maintained to be negotiable for a two-wheel-drive vehicle, and sportsmen can choose between hunting adjacent woodlands or managed wildlife food plots.



Danny Ray, lead wildlife technician at Caswell Game Land, looks over a field of wheat. Other attractions include fishing ponds.

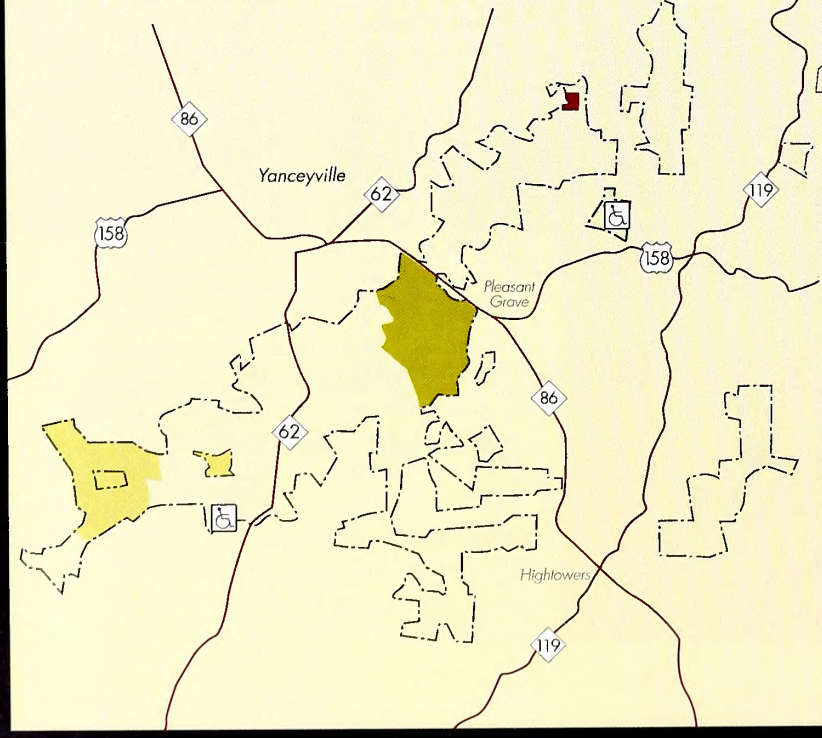
The game species Caswell is most noted for is wild turkeys. The population density of turkeys within the game land is about 26 birds per square mile. Large turkey populations are nothing new to the area. In fact, Ray said the first turkeys used for stocking in the state were captured at the Caswell Game Land.

Further enhancing turkey populations are the oak and hickory forests, which produce mast. As the icing on the cake, Ray and his staff plant entire fields of chufa (nut grass), an underground tuber that is as tempting to a turkey as chocolate candy is to a human. The cumulative effect is a public turkey-hunting location considered to be one of the best.

"You get a lot of folks out in the woods calling turkeys during the turkey season," Ray said. "Some have said that calling birds on the game land in Caswell is harder than the birds in other areas, simply because they get call-shy quicker. I know it's not unusual to be sitting on a ridge and hear someone calling a turkey on the next ridge."

The other big draw to Caswell is deer hunting. The northern Piedmont is generally known for producing big deer. Though

Caswell Game Land



- Restricted Area
- Archery Zone
- Waterfowl Impoundment
- Handicapped Hunter Access

Location: Caswell County, immediately south and east of Yanceyville

Size: 16,704 acres

Access: Open year-round. Two handicapped hunter access points (ATV usage allowed with permit): off N.C. 62 south of Yanceyville and off SR 1602 (near U.S. 158) east of Yanceyville. One small waterfowl impoundment off SR 1597 northeast of Yanceyville.

Caswell has the potential of producing bucks of 180 pounds or greater, hunting pressure prevents most deer from ever reaching that size. A quality buck will usually be in the eight-point range with a 16-inch spread.

While certain wildlife species populations are robust, Caswell's numbers of rabbits and quail are not as substantial. However, work is under way to change that. Caswell has been selected as a Cooperative Upland-habitat Restoration and Enhancement (CURE) site. The CURE program is designed to create habitat for early succession species such as rabbits, quail and songbirds. Within the Caswell Game Land, a total of 5,803 acres is under the program. The plan is to reduce stand densities and decrease canopy to stimulate ground vegetation. The Caswell Game Land CURE area has several acres, many in pine, that are planned for thinning or clear-cutting. There is also an intensive prescribed burning program planned that will invigorate and increase ground vegetation and enhance habitat.

"We have quail on the game land, but the numbers in our surveys show that quail populations are pretty poor," Ray said. "When you look at the data, quail populations keep dropping each year. Hopefully with the CURE program, we can turn that around in some way."

The best wing-shooting opportunities at the game land are dove hunts. Caswell has about 60 acres in dove fields. They are divided into four different areas to help spread dove hunters out. One dove area is located on high rolling hills offering panoramic views of the surrounding countryside. The main crops planted each year for doves are corn, wheat, sunflowers, sorghum, and browntop and proso millet. The crops are effective at pulling in a healthy number of doves around Opening Day. And though the dove fields are well-used by hunters, the pressure is not enough to warrant controlling the hunts through a permit system. So, year after year, a few fine dove shoots are available to any properly licensed hunter.

Recently, duck hunting was added to the game land's menu of offerings. A 12-acre waterfowl impoundment was built in 1998 with funding from Ducks Unlimited, the N.C. Habitat Foundation and the Wildlife Commission. The impoundment is a dammed stream area planted with Japanese millet and sorghum, which complements natural vegetation such as spike rushes and smartweeds. Hunters are most likely to encounter wood ducks, but occasionally mallards and Canada geese stop by.

In addition, two fish ponds are located on the property. One of the ponds is stocked with catfish and also supports good populations of bluegills and largemouth bass, while the other is on a more remote section of the property and is left wild.

Though all of these natural assets are substantial, it is the combined effort of top-notch wildlife technicians and biologists that makes Caswell Game Land what it is—a true work of art. ⊠

***Caswell Game Land** is most noted for its abundant wildlife, which includes deer, as evidenced by the tracks below, and waterfowl.*

KEN TAYLOR

Hunting: Allowed in season on Monday, Wednesday and Saturday. Game includes fox, dove, quail, rabbit, squirrel, raccoon, deer, turkey, waterfowl.

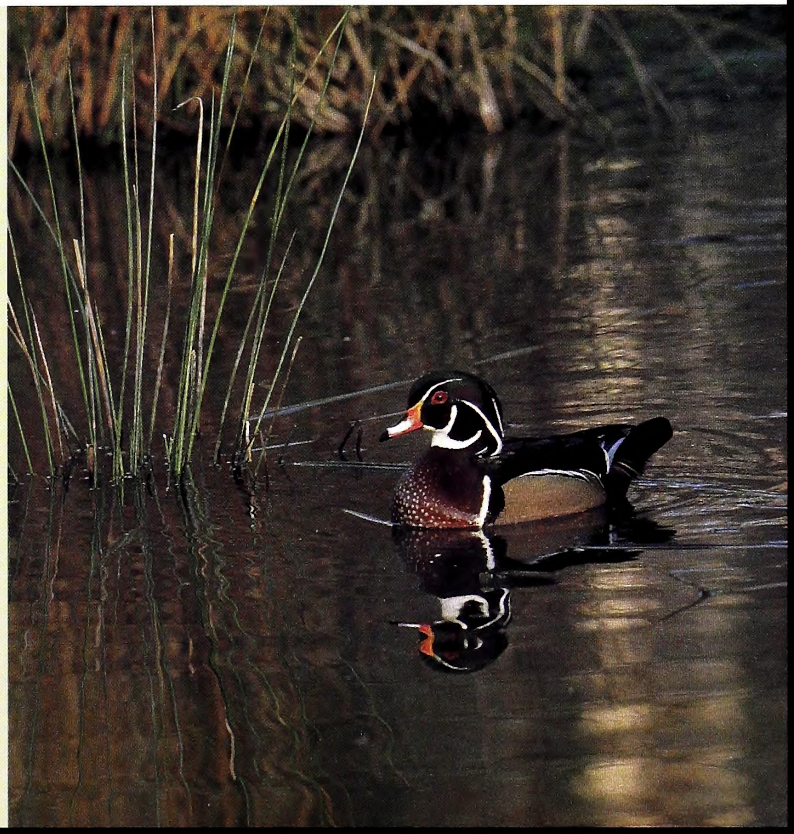
Fishing: Two ponds: one stocked with catfish, bluegills and largemouth, the other left wild.

Nongame: Carolina chickadee, downy woodpecker, brownheaded nuthatch, box turtle, rat snake, eastern hognose snake, southern flying squirrel, various bat species, mink, beaver.

Camping: Restricted to Sept. 1–Feb. 28 and April 7–May 14 at one designated hunter camping area off N.C. 62 south of Yanceyville.

Other Recreation: Bird watching and hiking when hunting season is closed. The removal of deadfall trees is also allowed with a game land permit.

More information: Log onto the Wildlife Commission's Web site at www.ncwildlife.org and click on Hunting/Trapping, or call the Caswell Wildlife Depot at (336) 694-9272.



TAR HEEL TARPON

written and photographed by Joel Arrington

More often associated with the Florida flats, tarpon are making a name for themselves in the Pamlico Sound.

***A live popeye mullet** hooked through the mouth is an ideal setup for tarpon.*

One morning a few years ago, days before the annual Oriental Tarpon Tournament, we anchored between Brant Island Shoal and the *Bessie* wreck. A dozen other boats lay widely scattered across the Neuse River mouth as the wind rose that morning, building white-capped seas. Some of the anglers were testing where they might fish during the contest.

Allen Propst put over croaker baits on 7-foot boat rods with 4/0 reels and 30-pound-test line. But the skates and cow-nosed rays wouldn't leave our baits alone. My brother, Cawood, released one after another in the first hour, shaking the fatigue from his arms after each release.

Then a line came suddenly taut and ripped through the now 3-foot seas. "That's a tarpon," Propst shouted.

Cawood dove for the rod and, with difficulty, lifted it from the holder. Before he could gain a turn on the spool, the fish launched itself into the warm July air, shaking its head wildly and rattling its gill covers. It crashed back in and headed north, taking 30-pound-test monofilament against a tight drag directly toward our anchor line. Cawood was able to slow the fish down, while struggling to slide around the console to the bow. The tarpon reversed its field, burned off 40 yards of line in seconds and began a series of heart-seizing leaps. Cawood was dragged from bow to stern several times before the fish tired and Propst was able to reach the leader. He made a couple of quick twists of the mono around his hand as the tarpon thrashed. Then he slipped a hand gaff harmlessly through the fish's lower jaw to secure it beside the boat.

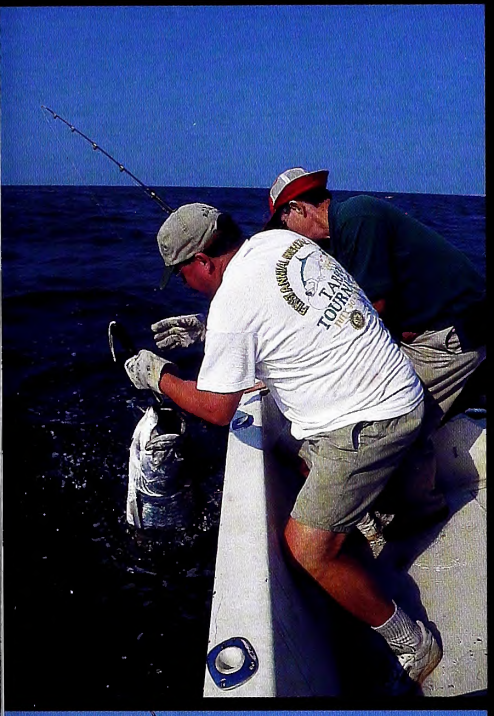
Propst stood and lifted from the water for us to admire most of the fish's 6-foot length, but there was too much to clear it all. He stuck a tag into the armor-plated back and, reaching deeply into the fish's mouth, freed the hook just as the gaff slipped from the jaw and the tarpon sank out of sight. Propst estimated the weight at 75 pounds, probably near average size for tarpon in the Pamlico Sound.

TARPON LIFE CYCLES

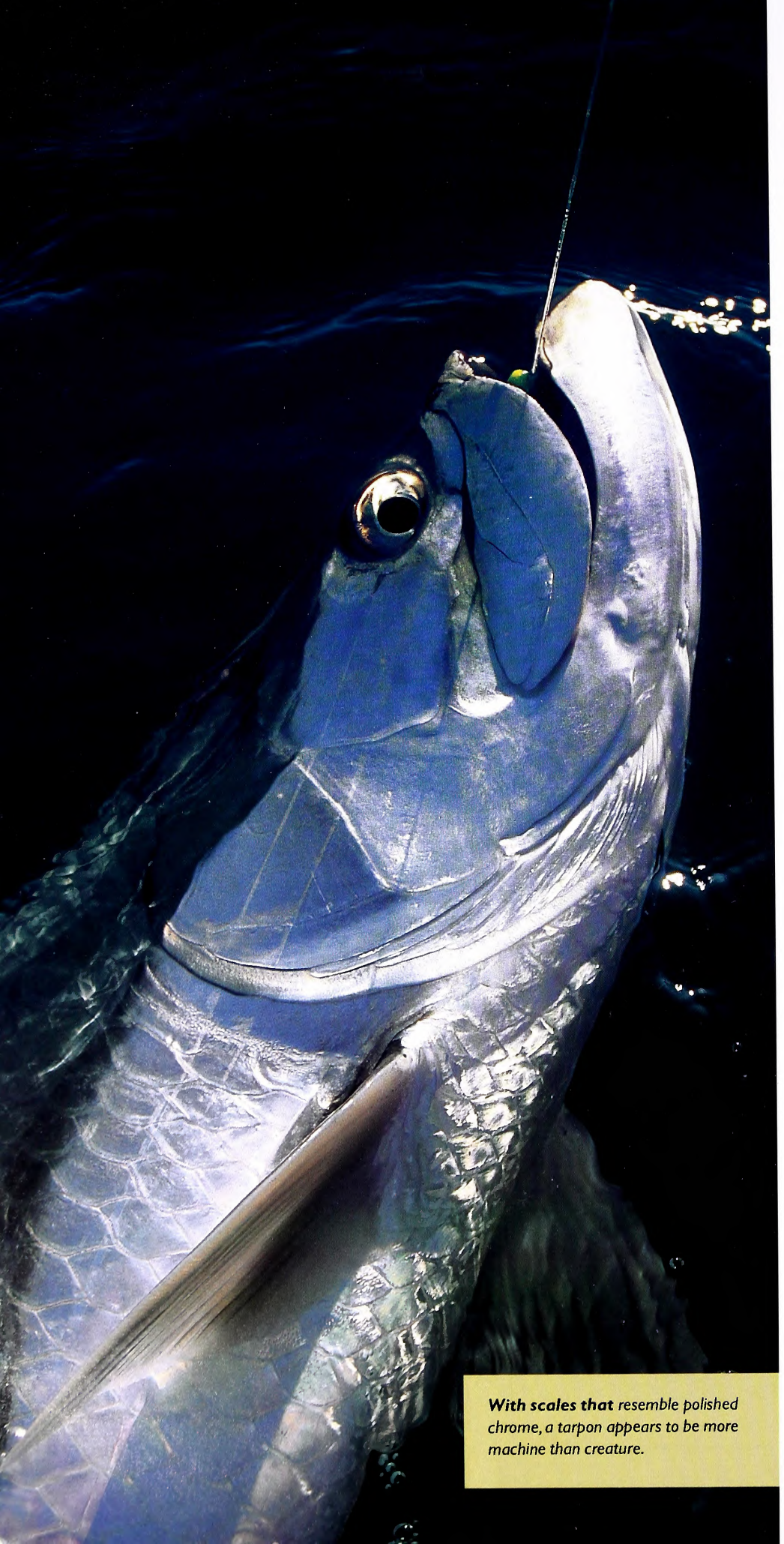
With the possible exception of a dolphin, no fish leaps like a hooked tarpon.

"That twisting, gyrating body, garmented in glistening silver and enveloped in a cloud of sparkling diamonds, was unlike any denizen of earth," wrote A.W. Dimock, author of *The Book of the Tarpon*, published in 1911.

The mouth is hard, making tarpon notoriously difficult to hook. Thrown lures are the norm. On any tackle, a tarpon's strength and stamina may force anglers to crank knots into their arms. A fish might make a shoal-boiling, line-peeling run, or it may choose to fight it out near the boat. Head-shaking leaps are common, executed in blind fury, rattling gill plates, with the fish crashing back into the water sometimes yards from the exit hole. The velocity of an initial run might leave the line arcing back toward where the tarpon came from. Sensitive to the least hook prick, a fish will often leap before you even know you have a bite.



***A tarpon is brought** to the side of the boat for a quick release back into the Pamlico Sound.*



***With scales that** resemble polished chrome, a tarpon appears to be more machine than creature.*

Tarpon of the western North Atlantic spawn on the edge of the continental shelf in the eastern Gulf of Mexico. Swimming in a circle, as many as 1,500 fish might pack tightly together 600 feet above the bottom 100 miles off Boca Grande Pass. Females, typically just under 6 feet long and more than 20 years old, might each spew 1.5 million eggs into water cloudy with milt. One spawning aggregation might result in a billion eel-like larvae. All the leptocephalus larvae remain at the mercy of ocean currents for a month until, through metamorphosis, they are converted to minute fanged inhabitants of a Florida estuary. Feeding on minnows, tarpon grow and gulp air at the surface, an ability that protects them from oxygen depletions typically caused by algae blooms on tropical summer days. Tarpon might grow in a coastal nursery for 15 years before joining older generations on lengthy migrations. A few travel up the Atlantic coast in summer, providing sport fisheries from Georgia to Virginia's Eastern Shore. Apparently only large fish are able to make the journey.

A tarpon might live 50 years, but only a minuscule fraction of its many fertilized eggs survive to maturity. Like the other long-lived fish species, tarpon are especially vulnerable to overfishing. After Florida instituted a $50 fee for a tarpon kill tag in 1989, with prepurchase mandatory, fewer than 100 tags a year have been filled. The fisheries office there reports that angling mortality is insignificant.

TARPON RUNS

No one in North Carolina is keeping tabs on noncommercial fish species such as tarpon, so all the evidence is anecdotal. But everyone agrees that the runs are highly variable. Tom Earnhardt, a North Carolina resident with extensive tarpon fishing experience, said that in Pamlico Sound one August day he saw more fish in 45 minutes than I have in 10 trips to Florida combined. "It was not a few hundred fish," he said. "Thousands, maybe tens of thousands of tarpon, and I don't think I saw one under 110 pounds."

Kit Taylor of Wrightsville Beach reported a phenomenal run on Oct. 12 last year. "I guess there were thousands and thousands of tarpon following a big push of mullet," he said.

George Beckwith, a guide based at Oriental, said that some years his parties have had double- and triple-headers, occasionally hooking as many as 10 fish in two hours.

You might see many fish one day and the next day see none. Last year at the tournament, Jack Eudy, a guide based in Roanoke Rapids and a regular competitor, said that "years when you see a lot of fish, you don't necessarily catch a lot. You only see them when they are rolling, gulping air. When they are moving, they are at the surface, not eating. Years when you see few fish, they are feeding deep."

Some say Pamlico Sound catches compare favorably to those at some Florida locations. "One year," Propst said, "[tournament competitors] released 55 tarpon in two days. By comparison, a writer for the Tampa newspaper told me that in one series of eight one- and two-day tournaments, Florida anglers released a total of 66."

N.C. TARPON MIGRATION ROUTE

***From the Gulf** of Mexico and the Florida Keys, tarpon migrate up the coast, stopping off at various northern points that include our Pamlico Sound.*

BAIT ON THE BOTTOM

Virtually all North Carolina tarpon fishing is with bait on the bottom from anchored boats. Success with lures has been rare, probably because of water turbidity and the lack of locations with dependable concentrations of fish.

Some experienced anglers, however, believe Florida fish have adapted to increasing fishing pressure by becoming more wary, a characteristic especially detrimental to success in clear water. Bob Stearns, a veteran angling writer in Miami, said he prefers to fish dirty water because the angler is less visible to the fish.

Tarpon are caught in other North Carolina locations, notably Frying Pan Shoals at the tip of Cape Fear. Frequently in summer they are also seen rolling in the Intracoastal Waterway and its tributary creeks.

Kit Taylor remains one of the few regular tarpon anglers who fish the Frying Pan Shoals. It is a 25-mile run one way from Masonboro Inlet. Distance, plus the fact that the best fishing occurs at dusk, necessitating return trips after dark, is why few try. This location is accessible from Southport with a shorter run, but with the often-rough Cape Fear River mouth to navigate.

Taylor likes late evening regardless of the tide but prefers low water. He said the season there runs from the Fourth of July to mid-October, but the best weeks may fall in late July and early August. He prefers an east wind because it brings clear ocean water to the shoals; southwesterlies spread dirty water from the Cape Fear River.

Anglers will often take 20 pounds of spots to the shoals for bait, but they also may net menhaden, which they keep in livewells. Taylor says he catches most of his tarpon on cut or whole dead baits fished on the bottom. He prefers spot and menhaden early in the season, and mullet late, when they are migrating from the creeks and along the beaches.

He believes position is important; he sets up along the edge of the shoal and casts into white water if possible. Because he must anchor away from his target and cast baits to rough water, Taylor uses 10-foot conventional surf rods with revolving-spool reels and 30-pound-test line. He also may use 7-foot boat rods but must be content with shorter casts. Taylor uses 4 feet of 175-pound-test monofilament leader snelled to a 7/0 or 8/0 circle hook. "Our deep-hooking rate fell to almost nothing when we changed to circle hooks," he said.

Pyramids weighing from 4 to 8 ounces may be required to hold bottom. Live menhaden are fished under a float in less than 10 feet of water.

Anglers have little idle time because they remain busy baiting hooks stripped by sharks and crabs or reeling in bluefish or other non-target species. In September, spinner sharks are good prospects. The shoal is alive, and these anglers never put a rod down.

Taylor says with circle hooks he gives a tarpon little drop-back. He takes up the slack and lets the hook set itself. The anchor line is rigged with a float for quick release so that the boat can follow a fish if necessary.

The largest tarpon Taylor and his friends remember weighed 147 pounds. "We've had some on I know would go 200 pounds," he said. ⊠

TUBING FOR TRANSIENT TARPON

About two hours before midnight on May 31, 1996, Eduardo Perez Guerrero, 34 that year, floated in the warm water in front of Havana's Copacabana Hotel. The air was soft, and bright stars rivaled the lights along the beach. In the calm, Perez could hear the laughter of tourists ashore.

The tire tube that supported the fisherman was laced with rope to make a seat. He held a coil of monofilament line on a bottle, and probably kept a plastic bag of cut bait in his pocket. As he fished, he kicked through the dark current with flippers.

In his letter to the Southeast Fisheries Science Center in Miami, Guerrero does not give details of how he caught the 70-pound tarpon that night, but we can imagine the leaps in the dark, the tube towed with a wake behind.

A practical businessman with mouths to feed, Guerrero had cut the "sabalo" into pieces for the market before he found the tag inscribed as follows:

NMFS 75 Virg. Bch Dr. Miami 33149 USA
Reward T-14576
Phone: 1-800-437-3936

So Guerrero mailed it to the tagging center in Miami. The tarpon originally had been tagged in Pamlico Sound on July 31, 1994, by Ben Snead of New Bern. Wayne Henry of Wilmington caught the tarpon while fishing the 2nd Annual Oriental Rotary Tarpon Tournament as Snead's guest. The tags had been provided to the tournament anglers by the Florida League of Anglers.

"The fish had a circle hook in its mouth and a 4-foot piece of monofilament leader trailing from it," Snead said. "The hook was about rusted through, and the line was coated with algae, so it had broken off a long time before, probably in Florida, where anglers were just beginning then to use those circle hooks."

Snead said he was able to remove the hook and leader before he tagged the fish. "Tarpon are hard to tag," he said. "They're armor-plated, and this was my first attempt. But I was finally able to slide a tag between the scales."

Snead has tagged many since, but that one could have been the first tarpon anyone tagged in Pamlico Sound.

"I heard Pat King tagged one the same day," Snead said, "so ours was one of the first two, if not the first, tarpon tagged in North Carolina."

It swam more than 800 nautical miles over the next two years, south along the Atlantic Coast and across the Florida Straits to the harbor at Havana where Guerrero bagged it.

Meet Wildlife Technician Chuck Deyton

written by Greg Jenkins
photographed by Jody Duggins

Chuck Deyton is a wildlife technician at the North Carolina Wildlife Resources Commission Depot in Marion, N.C. Marion is a town in the mountains near the headwaters of the Catawba River and close to the Pisgah National Forest.

Chuck's job keeps him very busy performing many different tasks—everything from pruning apple trees to checking the forest for bears. To be a wildlife technician, you must be **versatile**.

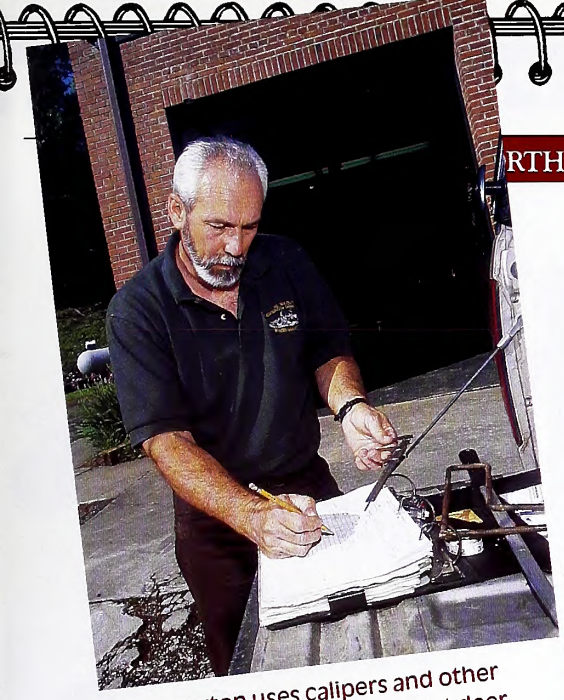
Deyton won an award in 2002 for being the wildlife technician of the year in North Carolina. With thousands of acres as his responsibility, Chuck has to be very organized and efficient. He and his two-man crew work on several **game lands**: Pisgah, Dysartsville and Green River.

But even with lots of work to do, Deyton loves the job he has had for 30 years. "You get to be outside and do something different all the time," he said.

WORKING WITH WILDLIFE

Chuck sees lots of wildlife every week, but he mostly handles four species: deer, bears, turkeys and wood ducks. Technicians put identification bands on ducks' legs to chart their nesting habits and seasonal **migration** patterns. When a hunter harvests a bear or a deer, the technicians weigh the animal, estimate its age by looking at its teeth, and take other measurements. Deyton used to spend a lot of time trapping and banding turkeys when the population was in trouble, but since the turkeys are doing so well now, that is no longer a priority.

Chuck and his crew spend a lot of time creating cover, open areas and food plots for wildlife. In the food plots, they plant grains such as millet that birds like to eat, grass and clover for deer and apple trees for all types of wildlife. Deyton's crew also executes **prescribed burns** to clear grass and brush off the forest floor. That helps prevent larger forest fires, which could damage mature trees and destroy wildlife habitat.



Deyton uses calipers and other tools to record data about deer that are harvested by hunters.

wood duck

F. EUGENE HESTER

SEASON BY SEASON

At the Marion Depot, Chuck Deyton has two assistants: Bobby Hilton, who has worked with the Wildlife Commission for 27 years, and Ryan Jacobs, who has worked on the crew for one year. Here are a few of the tasks Chuck and his crew must do at various times of the year.

SPRING
- Paint game land boundary lines
- Survey **grouse drumming** routes
- Fertilize food plots
- Replant and reseed fields as needed
- Trim roads and food plots

SUMMER
- Trap and band wood ducks
- Plant dove fields
- Survey bear bait lines
- Survey **hard mast** (count acorns in oak trees)
- Mow fields and food plots

FALL
- Collect data on bear and deer kills
- Maintain **boundary lines**
- Maintain roads

WINTER
- Finish collecting deer data
- Prune and fertilize apple trees
- Map areas with **Global Positioning System (GPS)** data recorder
- Perform prescribed burning

TO BE A TECHNICIAN, TRAIN YOUR BRAIN

It takes a lot of training to become a wildlife technician. At a minimum, you need a two-year college degree and a couple years of work experience to be considered for a job with the Wildlife Resources Commission. Chuck recommends a four-year degree in wildlife management, but he says it would be even better to have a master's degree because the career is very competitive and there are a lot of applicants for each job opening.

In addition to advanced schooling, you must have a commercial driver's license that allows you to drive big trucks. You will need a **pesticide** license and a certificate that allows you to do prescribed burns. Advanced computer skills and certification in first aid and CPR are also necessary. You need to be in good physical condition because part of the job consists of clearing away trees and brush from game lands.

Since Chuck is the crew leader of a three-man team, he must also know how to assign duties to his crew, file reports on their activities, write work plans and request new equipment and tools for them.

Deyton checks a wood-duck box for signs of nesting.

"You get to be OUTSIDE and do something DIFFERENT all the time."

LONG-DISTANCE FLYERS

Chuck and his crew put identification bands on the legs of wood ducks to record how far they travel during their migration. Birds banded in North Carolina have been found in faraway places such as Mexico, Alabama, Texas and Canada.

A Global Positioning System data recorder helps Deyton make accurate measurements and maps of food plots on game lands.

WHAT DOES IT MEAN?

versatile: able to perform many different tasks skillfully

game lands: areas designated and set aside for hunting and fishing

migration: the travels of birds to find warm climates during the winter and cool weather during the summer

pesticide: a chemical agent sprayed on trees and plants that kills certain types of insects

prescribed burn: a small, planned and controlled forest fire used to create wildlife habitat or reduce the hazard of a large, destructive fire

boundary lines: marked trees indicating the border between game lands and other property

hard mast: food, such as acorns, for animals

grouse drumming: the wing movements made by a male ruffed grouse when he beats or "drums" his wings on logs or large rocks as a mating call

Global Positioning System: a handheld computer that uses satellites to mark exact locations of boundary lines and to indicate locations of certain places for purposes of navigation and mapping

SOMETHING'S FISHY

Wildlife technicians use an interesting food as bait for bears. They string cans of sardines 10 feet high in trees and pop open the cans so the bears can smell them. Bears love fish, so they will climb into trees to snack on the tasty, smelly sardines. Sometimes other animals such as raccoons and beetles steal the sardines before the bears can get to them. How do wildlife technicians know when a bear has eaten the sardines? They look for deep bear claw scratches in the tree bark and bear teeth holes in the cans.

ROAD WARRIORS

Chuck's crew often has to build or repair dirt roads that lead into a game land. They use a bulldozer to knock down trees and grade the dirt. They also install culverts that move water away from the roads, and they dump gravel on the roads to make them easier to drive on.

Baiting for bears is a fishy, messy task, because Deyton uses sardines to attract the big, furry woodland creatures.

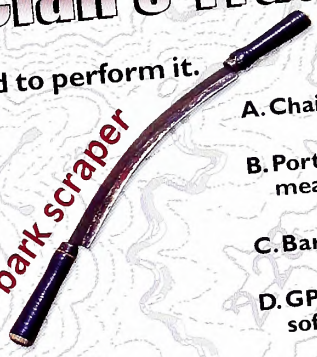
black bear

KEN TAYLOR

Tools of the Technician's Trade

Match the task to the tools required to perform it.

1. Marking game land boundary lines
2. Planting food plots for wildlife
3. Building access roads to game lands
4. Performing prescribed burns
5. Cutting trees and clearing brush
6. Banding wood ducks and charting their nesting activities
7. Mapping boundaries and features of land tracts
8. Recording data from harvested deer or bears
9. Baiting for black bears



Answers are below.

A. Chainsaw, apron, gloves, helmet, goggles

B. Portable scale, data chart, tooth extractor, measurement calipers

C. Bark scraper, orange paint

D. GPS data recorder, computer with mapping software, map printer

E. Tractor, seed, lopping shears, fertilizer, pesticide

F. Bulldozer, culvert pipe, gravel

G. Sardine cans, string

H. Duck boxes, duck traps, waders, banding tool, data chart

I. Drip torch, fireproof clothing, helmet with face shield, fire plow

millet

ANSWERS: 1-C, 2-E, 3-F, 4-I, 5-A, 6-H, 7-D, 8-B, 9-G

GET OUTSIDE

Plants and animals: In your backyard, a local park or any of North Carolina's 35 state parks or recreation areas, observe the various wild animals—birds, insects and small mammals such as squirrels and chipmunks. Notice the way they use plants. Where do the animals live? What do they eat? Can you think of ways animals use plants other than for food and habitat? Could animals survive without plants?

Field trip: Visit the N.C. Zoo in Asheboro and keep a notebook of all the different animals you see and the habitats in which they live. How have the zookeepers created habitats for animals that are not native to North Carolina?

READ AND FIND OUT

- *Fish & Wildlife Technician* by Jack Rudman, National Learning Corporation, 1994
- *The Field Guide to Wildlife Habitats of the Eastern United States*, by Janine M. Benyus, Simon & Schuster Trade, 1989
- *Planting Food Plots for Deer and Other Wildlife*, by John Weiss, Woods N' Water Inc., 2002
- *Secrets of the Forest* (also titled *What's in the Green, Dark Woods*) by Muriel Steffy Lipp, NorthWood Press, 1996
- *The Kids' Wildlife Book* by Warner Shedd, Williamson Publishing, 1994

IT'S WILD!

Project WILD activities for teachers and students that correlate to this topic include the following:

How Many Bears Can Live in this Forest? teaches the importance of suitable habitat and the consequences on black bears if one or more habitat components is relatively scarce.

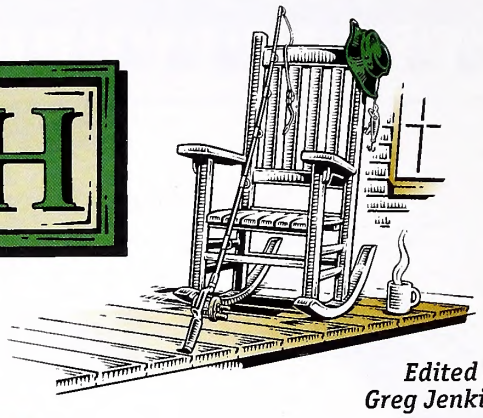
Checks and Balances teaches students to identify four factors that can affect the size of a wildlife population and allows students to become managers of a herd of animals.

GET WILD

WILD workshops offered by the N.C. Wildlife Resources Commission provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at www.ncwildlife.org and click the link for Education/Workshops.

BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

Angler Hauls in State-Record Cobia

Friday, May 16, was one of those once-in-a-lifetime days for Lewis Boyd. He and his friend, Bill Hogan, were fishing on the shoals near the point at Cape Hatteras in Hogan's 23-foot boat. The weather was beautiful—a light west wind and temperatures in the mid-70s. A southeast swell was rolling, but the water was clear, and Boyd and Hogan could see the big cobia patrolling for crabs along the shoals in 3 to 4 feet of water.

The men started sight-casting bucktails at the fish with spinning gear, and the cobia began to hit. *Boom*—Boyd hauled in one that looked to be in the 70-pound range. *Bam*—Hogan hauled in another about the same size. *Pow*—they were both hooked up at the same time with fish just as big. The cobia were in a feeding frenzy and hitting everything in the water. "It didn't matter that day," Boyd said. "We could have thrown a rock at them, and they would have hit it."

Then Boyd latched onto the monster cobia that took both men to haul into the boat. The men took some photos at the dock, but they knew they had something special. So they hurried up to TW's Bait & Tackle shop in Kitty Hawk to get the beast on a certified scale.

When they hung the fish up, the scale indicated 113 pounds, a new state record for cobia. The old record of 105 pounds was set in 2002. Boyd's fish measured 5 feet, 7 inches from the fork in its tail to its snout, and it had a girth of 35 inches. The other three cobia weighed 72, 74 and 78 pounds. "I've cobia-fished for about 25 years," said Boyd, who lives in Duck. "If you're not lucky at it, no skill is going to help you."

Boyd caught the monster cobia on 30-pound-test line, using a pink bucktail fixed with a 7/0 hook and baited with squid. Boyd and Hogan filleted all of their fish, but Boyd plans to have a mold mount made of his fish.

This lunker was not Boyd's first record catch. He reeled in a world-record Spanish mackerel in 1981 that weighed 8 lbs., 14 oz. His record was broken by a 13-pounder in 1987.

— Greg Jenkins

JOE BOYD

***Lewis Boyd was** all smiles after cotching this 113-pound monster cobia.*

Sportsmen Donate Night-Vision Goggles to Officers

PHOTO COURTESY OF HIGH COUNTRY SPORTSMEN COALITION

***From left:** Wildlife Areo Sgt. Mike Shirley, Wildlife Master Officer Kelly Pittman and Travis Proctor, president of the High Country Sportsmen Coalition.*

The High Country Sportsmen Coalition (HCSC) recently presented wildlife enforcement officers Mike Shirley and Kelly Pittman with a pair of night-vision goggles and an infrared camera. The coalition, which comprises Avery and surrounding mountain counties, asked Pittman what piece of equipment would benefit him most in job safety and law enforcement. His answer was the goggles.

The HCSC purchased the high-tech binoculars at a cost of $2,819 and an infrared night camera at a price of $359. The organization received the officers' thanks and a letter from the N.C. Wildlife Resources Commission expressing its appreciation for the donation.

The coalition is a conservation-minded organization that supports restoration of healthy populations of wildlife species and their habitats. The HCSC also backs law enforcement efforts to protect these species.

Anyone interested in helping out financially or physically in these efforts may call Travis Proctor at (828) 733-9146 or Boots McIntosh at (828) 733-9111.

NOAA Says Flounder Were Overfished in 2002

The National Oceanographic and Atmospheric Administration (NOAA) recently released its fisheries report to Congress for 2002, "Sustaining and Rebuilding: The Status of the U.S. Fisheries." The report reflects the continuing efforts of government and fishermen to improve America's marine fish stocks. It stated that one additional fish stock was fully rebuilt, four species were taken off the overfished list in 2002 as they head toward full recovery, and 70 overfished species continue to recover under federal rebuilding plans.

Summer flounder in the mid-Atlantic was returned to the list of overfished species in 2002 after its removal in 2001. However, the last assessment—which determined summer flounder to be overfished—also projected the stock would no longer be overfished in 2003. NOAA is scheduled to receive the results of a new assessment this summer.

State Seeks Input on How to Protect Fisheries Habitat

The N.C. Department of Environment and Natural Resources (DENR) is seeking input from citizens about how to protect fisheries habitats in the state. The agency is working on the Coastal Habitat Protection Plan (CHPP), which was begun after the General Assembly passed the Fisheries Reform Act in 1997.

DENR needs to hear from people who are interested in fisheries resources, so it is conducting a series of meetings so the public can understand the CHPP and provide quality feedback. The agency wants people's experience, advice and opinion to better prepare the protection plan.

North Carolina's valuable coastal habitats have been dramatically altered over the years. These changes have affected shellfish and other fisheries populations that depend on healthy habitats for survival. Wetlands, salt marshes, sea grass beds, muddy shore bottoms, the ocean floor and the water fish and shellfish inhabit are all important habitats. Dredging and filling, land and shoreline development, fishing and boating and polluted runoff can all impact these valuable resources. The purpose of CHPP is to focus on workable solutions to these problems to ensure a healthy fishery resource for the future.

Coastal Habitat Protection Plan Public Comment Meetings

Wed., July 23	N.C. Museum of Natural Sciences, Raleigh
Thurs., July 24	Mooresville Citizens Center, Mooresville
Tues., July 29	Brunswick Electric Membership Corp., Supply
Wed., July 30	Northeast Branch of New Hanover County Library, Wilmington
Tues., Aug. 12	Dixon High School, Dixon
Wed., Aug. 13	East Carteret High School, Beaufort
Tues., Aug. 19	N.C. Aquarium, Manteo
Wed., Aug. 20	Town Council Chambers, Edenton
Tues., Sept 9	N.C. Estuarium, Washington
Wed., Sept. 10	Pamlico County High School, Bayboro

All meetings begin at 7 p.m.

LAWRENCE S. EARLEY

Nature's Ways

The Writing on the Web

written by Jeff Beane
illustrated by David Williams

Remember that delightful children's book about a clever spider that saved a personable pig named Wilbur from the smokehouse by spinning adjectives like "Some Pig" and "Radiant" into her web? Well, E. B. White's *Charlotte's Web* had some factual basis. Nearly 80 spider species incorporate peculiar patterns resembling writing into their webs. Best known for this behavior are the large, colorful orb weavers in the genus *Argiope*, especially *A. aurantia*, which is known by many common names, including "writing spider."

The thickened zigzags of silk spun by these spiders are called stabilimenta, because it was originally assumed that they provided structural stability. But another theory holds that stabilimenta make webs visible to birds and other animals that might otherwise blunder into them and cause damage. That might explain why only diurnal spiders "write." Other hypotheses maintain that stabilimenta attract insects by reflecting ultraviolet light, or that they help camouflage the spider, or that they allow spiders to adjust thread tension for detecting different sizes of prey. But studies have shown that hungry spiders spin smaller stabilimenta, and that webs without them may actually catch more insects.

Whatever its true function, this "spider script" enhances a spider web's beauty and mystique while stimulating human imagination.

Researchers to Study Deep-Sea Creatures

In search of new teaching resources for North Carolina schools, Liz Baird, coordinator of student outreach and distance learning for the N.C. Museum of Natural Sciences, is planning to travel to the bottom of the Atlantic Ocean. This month, Baird wants to use the power of the World Wide Web to bring students along with her.

JIM BUNCH

This summer, researchers plan to study places where deep-sea wildlife lives by using a tiny submarine.

From a research vessel in the Gulf Stream, Baird and a team of researchers representing five agencies will work around the clock for 10 days to collect, document and share data not only with each other, but with teachers and students across North Carolina. One North Carolina schoolteacher, selected from a list of Educators of Excellence Institute participants, will accompany the research team and develop lesson plans based on the data being collected.

Collection tools include nets, trawls and a submersible vessel capable of taking four people 3,000 feet below the ocean surface. Team members will provide daily research updates, post images and respond to questions submitted via the Web. Part of the trip may be broadcast live online.

The mission, dubbed "Islands in the Stream: Exploring Underwater Oases," is funded by the National Oceanographic and Atmospheric Administration (NOAA) Office of Ocean Exploration. Its goal is to increase knowledge of life surrounding deep-sea reefs off the continental shelf of the southeastern United States. A videographer will add to footage gathered last summer for a movie about North Carolina's deep-sea life. For more information about the mission, visit the museum's Web site at www.naturalsciences.org or www.oceanexplorer.noaa.gov.

VIC VENTERS

Roanoke bass

Eno Dam Removal Should Improve Habitat

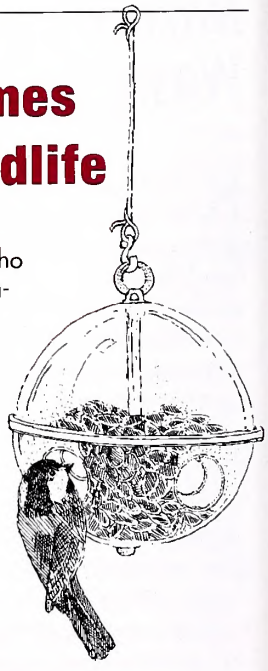
The N.C. Division of Parks and Recreation, the N.C. Division of Water Resources and the U.S. Army Corps of Engineers are planning to remove the aging and deteriorating Pleasant Green Road dam and spillway in Eno River State Park pending completion of an environmental assessment. A 2001 study of the dam, which was built in 1915, determined that the dam will fail if not removed or replaced. Two existing weir gates are inoperable, and there is evidence of seepage and structural weaknesses that pose safety and liability issues for the state park.

The dam is 122 feet long and 12 feet high and impounds a 21.8-acre lake about midway between the park's Cole Mill Road access and Few's Ford access. It was built by Duke Power to provide cooling water for a steam generation plant that was dismantled in 1958.

There are environmental benefits to the removal project: 13.4 miles of the Eno River and 42.7 miles of tributaries will be freed of impoundments. Habitat improvements are expected for fish species that are common in the river, and also for threatened species such as the Carolina darter, a state-listed species of special concern, and the Roanoke bass, a game species considered significantly rare. Improved habitat is also expected for seven rare species of mussels that are on either federal or state lists of threatened species.

Wildlife through the Year

Hot Times for Wildlife



The heat of summer can cause many problems for folks who like to put out bird feeders. The National Wildlife Federation recommends that if you provide suet, reduce the amount you offer in times of extremely hot weather. Heat can make suet rancid and unhealthy for birds. Runny suet can also stick to birds' feathers, making them hard to keep clean. Use rendered suet or heat-resilient suet blocks that are available commercially.

It is always wise to change the nectar in hummingbird feeders every few days. The feeders should be washed thoroughly with hot soapy water and rinsed completely every time you refill them. When cleaning hummingbird feeders, be sure to clean the feeder ports well. These ports can easily get black mold on them, especially in the summer.

The dog days of summer can be some of the best times for viewing wildlife. By providing clean, friendly eating establishments, you'll be guaranteed many return customers.

—Chris Powell

Letters to the Editor: A Follow-up Dispatch From the AT

Editor's note: Publications and outreach coordinator Sherry Outlaw went the extra mile to find an Appalachian Trail hiker mentioned in the story "5 Days on the AT" from the May issue of Wildlife in North Carolina. *Sherry sent Robert Sharp, who was known on the trail as "Little Bob," a copy of the magazine, and Sharp sent the following letter of appreciation.*

Dear Sherry,

Thanks for tracking me down and sending me the May issue of *Wildlife in North Carolina*. I'm honored to be mentioned in the article about the Appalachian Trail on page 14. I thoroughly enjoyed the entire magazine.

I did indeed hike to Maine, as evidenced by the [enclosed] photo atop Katahdin, four months and 2,000 miles after meeting Rodney (Foushee) and Jody (Duggins). Although arduous, it was an incredible journey. Needless to say, I loved every step, every mile and every state.

JODY DUGGINS

Robert "Little Bob" Sharp

The flowers, wildlife and vistas were beautiful as I followed spring north through the mountains; but what truly made the trip meaningful were all the friends I made along the way.

I first saw Jody and Rodney in Deep Gap, met them again atop Albert Mountain, and finally camped and visited once again at Rock Gap Shelter. I often pondered their fate as I continued north across Fontana Dam, up into the Smokies and onward. North Carolina is beautiful and wonderful and friendly. The Appalachian Trail traverses a wild and pristine wilderness that your state can be proud of.

Coincidentally, I returned to Deep Gap in April with my wife, my dog and a fellow hiker I met last year. We planned to cook, camp and provide camaraderie to hikers passing through. A late spring snow sent everyone on the trail in search of permanent shelter after a couple of days. We had a great time and made many new friends.

Thanks again. Please tell Rodney and Jody hello from "Little Bob" and "happy trails to all—keep smiling until we meet again."

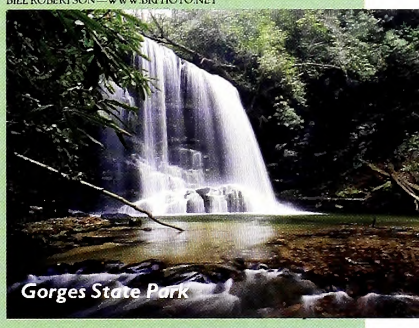
Robert "Little Bob" Sharp
Ruston, La.

did YOU know?

The N.C. Division of Parks and Recreation has spent the last two years gathering predevelopment information to craft a master plan for Gorges State Park, North Carolina's newest—and perhaps its most environmentally sensitive—state park. Because the 7,092-acre tract in Transylvania County is home to dozens of rare plant and animal species, the plan required a large amount of research.

Planners considered topography, soils, site ecology, adjacent land use, archaeology and significant physical and environmental constraints. Detailed natural resource inventories were conducted for rare vascular plants, geologic patterns, timber rattlesnakes, small mammals, amphibians, fish communities and stream habitat, natural plant communities, birds and an endangered plant species—Fraser's loosestrife.

BILL ROBERTSON—WWW.BRPHOTO.NET



Gorges State Park

Gorges State Park was opened in 1999 following the state's purchase of 10,000 acres from Duke Energy Corp. About 3,000 acres adjacent to the park are managed by the N.C. Wildlife Resources Commission.

While the planning process was under way, interim facilities were constructed, including an entrance road, parking and picnic areas and a maintenance compound. Major permanent construction will take place in phases over an unspecified period of years. Once complete, the park will support hiking; primitive, family and RV camping; horseback and mountain-bike riding; and fishing and boating.

On Patrol

On the opening evening of bear season, senior wildlife officer Robert Wayne was working a baited site. While hiding in the fork of a path where each fork led to a baited stand, Wayne heard three gunshots. One hunter drove his four-wheeler to a spot near where the officer was hiding, disconnected a trailer and headed to meet a fellow hunter at another stand.

After both hunters hurriedly left the woods, Wayne went to see what they had shot. He found a large, freshly killed sow bear in the bait pile, so he knew he only had to wait for the hunters to return and retrieve the bear. As Wayne waited, another bear appeared and began to drag the dead bear back into the woods.

Not wanting his evidence to get away, Wayne shooed away the second bear and sprayed mosquito repellent on the carcass to dissuade other bears from taking the sow. Wayne climbed a tree stand and waited for the hunters to return. When they arrived and began hauling the bear away, Wayne identified himself and issued both hunters citations for unlawful possession and taking a black bear with the use of bait.

ILLUSTRATION BY JACKIE PITTMAN

Calendar of Events

FRIDAY-SATURDAY, AUG. 1–2

A children's Trout Derby and BBQ Cook-off will take place in Cherokee. Visit www.cherokee-nc.com, e-mail info@nc-cherokee.com or call 1-800-438-1601.

SATURDAY, AUG. 2

Join a hike of Fox Den Loop Trail at Lake James State Park in Nebo, guided by a park ranger. Visit www.ncsparks.net, e-mail Tim Benton at lajasp@icu2.net or call (828) 652-5047.

SUNDAY, AUG. 3

Learn how to record your personal experiences in nature in a journal at Chimney Rock State Park. Visit www.chimneyrockpark.com, e-mail visit@chimneyrockpark.com or call (828) 625-9611 or 1-800-277-9611.

SATURDAY, AUG. 9

Enjoy insect treats, creepy-crawly critters and nonstop horror movies during BuGFest! at the N.C. Museum of Natural Sciences in Raleigh. Visit www.naturalsciences.org or call (919) 733-7450.

THURSDAY–SUNDAY, AUG. 14–17

The city of Wilmington and the Hilton Riverside hotel will host the North Carolina Ducks Unlimited state convention. Call (910) 592-3898.

juvenile copperhead

NC WILDLIFE RESOURCES COMMISSION

SATURDAY, AUG. 16

Experts will talk about venomous snakes found in Chimney Rock State Park as part of the Rowdy with Reptiles program. Visit www.chimneyrockpark.com, e-mail visit@chimneyrockpark.com or call (828) 625-9611 or 1-800-277-9611.

SUNDAY, AUG. 17

The Broad River Greenway in Boiling Springs will host "Spiders and Snakes, Oh My!" live demonstrations with arachnids and reptiles. Visit www.broadrivergreenway.com or call (704) 434-2357.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to greg.jenkins@ncwildlife.org, or call (919) 733-7123, Ext. 264.

Wildfire Act Could Allow Clear-Cutting in National Forests

The Agriculture Committee of the U.S. House of Representatives passed a controversial wildfire bill in May that could allow timber companies to clear-cut 1,000-acre parcels of national forest land and reduce citizen comment on forest management issues. Last year's fire season attracted national attention when more than 7 million acres of American forest burned, costing 23 firefighters' lives and $1.6 billion to combat. In August 2002, President George W. Bush announced his Healthy Forests Initiative, calling for reduced regulatory obstacles to forest-thinning projects. Legislators in the U.S. Congress agreed that the forest fire problem deserved immediate attention, but they debated possible solutions throughout the fall and winter.

The new wildfire management bill, called the Healthy Forests Restoration Act, could affect up to 20 million acres of federal land over five years, including national forests and areas under the jurisdiction of the Bureau of Land Management and the Fish and Wildlife Service. Proponents of the legislation claim that forest fire prevention is dangerously stalled by environmental litigation and complicated procedures for approving forest-thinning projects. The bill aims to expedite the process by limiting public comment periods to 15 days and allowing only 45 days for litigation after project approval. It also allows for reducing the extensiveness of environmental impact assessments, which are required before logging projects. If passed, judges dealing with forest-thinning litigation may be required to give the cases a higher priority than others—including criminal suits—in order to render a decision within 100 days of filing. Environmentalists argue that, if enacted, the bill would limit public ability to participate in land management decisions that affect them.

Although the bill's declared purpose is to decrease fire risk to communities, opponents say it would allow timber companies to perform logging projects under the guise of fuel reduction in areas located miles away from any homes.

MELISSA McGAW

***If the Healthy Forests** Restoration Act becomes law, logging in national forests could become a common sight.*

Catch Us at these Numbers

1-800-662-7137 to report violotions of hunting ond fishing lows

1-800-628-3773 (NC VESSEL) for boat registrotion ond titling

1-800-675-0263 for hunting dates and shooting hours for migratory game birds

1-888-248-6834 (2HUNTFISH) to purchase most licenses with VISA or MosterCord using o touch-tone telephone

1-800-446-8663 (I GOT ONE) to report big game harvests

Connect to the Commission's online Web site ot **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $53,463,809.60

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

N.C. WILD STORE

CONTINUE *the* TRADITION

2003
North Carolina Migratory Waterfowl Print and Stamp Set

Cypresses stand like sentinels along a blackwater bay. A splash breaks the morning stillness, and a Boykin spaniel retrieves the kill. Wilhelm Goebel's "Traditions at Suggs Mill Pond" portrays the artist and his daughter duck hunting on Suggs Mill Pond Game Land. When you buy North Carolina's 21st waterfowl print and stamp, you contribute to wetlands conservation and commemorate our hunting heritage. Overall print size: 12" x 14"; image size 6 ½" x 9". The set includes a free museum-edition print of Ron Louque's "Canvasbacks at Whalehead." *(See the description below for additional information.)*

No shipping-handling fee or discount applies.

2003 Print and Stamp Set
$145 ITEM CODE **DSP03**

2003 Mint Stamp Only
$10 ITEM CODE **DSPS03**

Free *with purchase of 2003 print & stamp set*

"Canvasbacks at Whalehead"

This limited-edition museum print of a Ron Louque painting depicts canvasbacks in flight above the historic Whalehead Club in Currituck County. It is a gift when you purchase the 2003 state or federal print and stamp set, and it is also sold separately. Overall print size: 19" x 24"; image size 13" x 18". *No shipping-handling fee or discount applies.*

$50 ITEM CODE **FA1**

The 2003-2004 federal duck stamp print featuring Ron Louque's winning entry is also available. *(See page 40 for details.)*

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

▲ Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

▲ Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

left front design

left front design

▲ **Largemouth Bass.** This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12LRG** (large)
A12XXL (extra extra large)
Extra large size is no longer available.

▲ **Snow Geese.** Celebrate waterfowl conservation with this white, all-cotton tee. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

▲ **Wild Turkey.** A timeless spring scene makes this all-cotton tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail and tree. Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

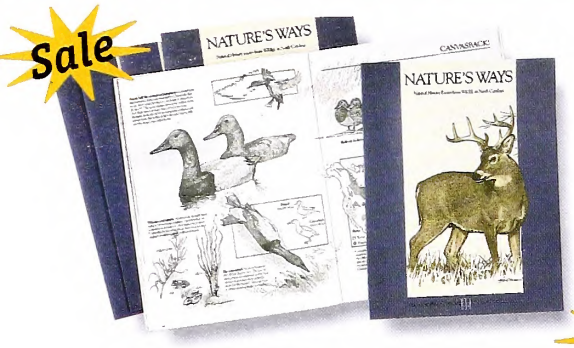
Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams. Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**



Nature's Ways Collection ▲

Looking for drama and science combined? "Nature's Ways" will deliver. Includes a comprehensive index.

Half-price while supplies last.

Boxed Set $15 ITEM CODE **M10**

Unboxed Set $13.75 ITEM CODE **M9**

Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**

Rivers of North Carolina ◀

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* (Nov. 1999) chronicles the natural history of 17 major river basins.

Half-price while supplies last.

$5 ITEM CODE **M11**

North Carolina WILD Places: A Closer Look ◀

Book and Posters Set.

Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a WILD Places map by Jackie Pittman make this set a teaching tool.

$16 ITEM CODE **E6**

Dogs that Point, Fish that Bite ▼

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

Hardbound ~~$19.95~~ $14.95

ITEM CODE **M8**

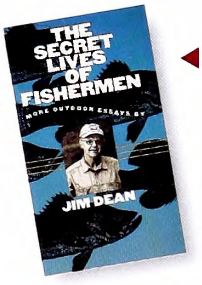
Paperback ~~$10.95~~ $8.00

ITEM CODE **M12**

Set of both volumes

Hardbound $30.00

ITEM CODE **M14**



The Secret Lives of Fishermen ◀

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound ~~$24.95~~ $18.50

ITEM CODE **M13**

Items not pictured:

All Things Are Connected

Video and Activity Guide. Chief Seattle's 1855 speech inspired this film and activity guide for classrooms and groups. $22 ITEM CODE **W3**

Bird Houses and Feeders

This guide to building birdhouses includes tips for turning household objects into ready-made feeders and homes. $2 ITEM CODE **M6**

Magazine Binder

Store 12 issues of *Wildlife in North Carolina* in a sturdy binder. $10 ITEM CODE **M2**

Gardens for Butterflies

An 8-page guide to creating your own garden for attracting butterflies. **FREE** with each butterfly poster set. $2 ITEM CODE **M5**

N.C. Wildlife Viewing Guide

Discover 90 of the state's premier viewing locations. $5.95 ITEM CODE **N6**

2003-2004 Federal Duck Print and Stamp ▶

Greater snow geese take wing over the Chincoteague National Wildlife Refuge on the 70th edition of the federal duck stamp. Artist Ron Louque is making signed prints of the stamp available, and we have a limited number. Overall print size: 12" x 14"; image size 6 1/2" x 9". Includes a free museum print of the artist's "Canvasbacks at Whalehead."

(See page 37 for details.)

A $9.50 shipping and handling fee applies.

This item not subject to 15% discount.

Print $189 ITEM CODE **FDSP03**

Stamp $16 ITEM CODE **FDSS03**

Where are the TREES?

WILDLIFE COMMISSION SPOTLIGHT

When sportsmen return to some of the commission's game lands this fall, they will see the latest signs of forest management. The charred bases of trees, an openness in the understory, fresh stumps, new growth—these are all signs that the game land crews have been hard at work fulfilling the commission's goal for forest management. Forest management on the game lands creates and maintains a diversity of habitats to benefit species with varying ecological needs.

Thinning

In a forest's early stages, the canopies of the growing trees form a dense overstory that allows very little sunlight to penetrate. Years of darkness reduce plant diversity and abundance.

Thinning timber stands allows more sunlight to reach the forest floor. Before the cutting begins, wildlife foresters select trees that are diseased or otherwise of poor quality, leaving the best trees to grow into a strong forest.

Thinning encourages new plant growth and different plant species, a combination that can meet the food and cover requirements for a greater diversity of wildlife.

MELISSA McGAW

Selective thinning creates healthier forests.

KEN TAYLOR

A controlled burn allows the forest floor to rejuvenate.

Burning

Thinning is a good beginning. But with no further management, habitat gains from thinning could be lost.

Prescribed fire is the most cost-effective and beneficial way of controlling tree density while maintaining a diverse plant community. In some minds, the words "burn" and "forest" should never be used together. Mature trees will survive the burn, however, and the forest revives very quickly. Fire changes soil conditions within the forest, allowing many fire-loving herbaceous plants —especially beneficial grasses—to grow. Fuel-reduction burns release nutrients tied up in leaf litter, benefiting plant growth.

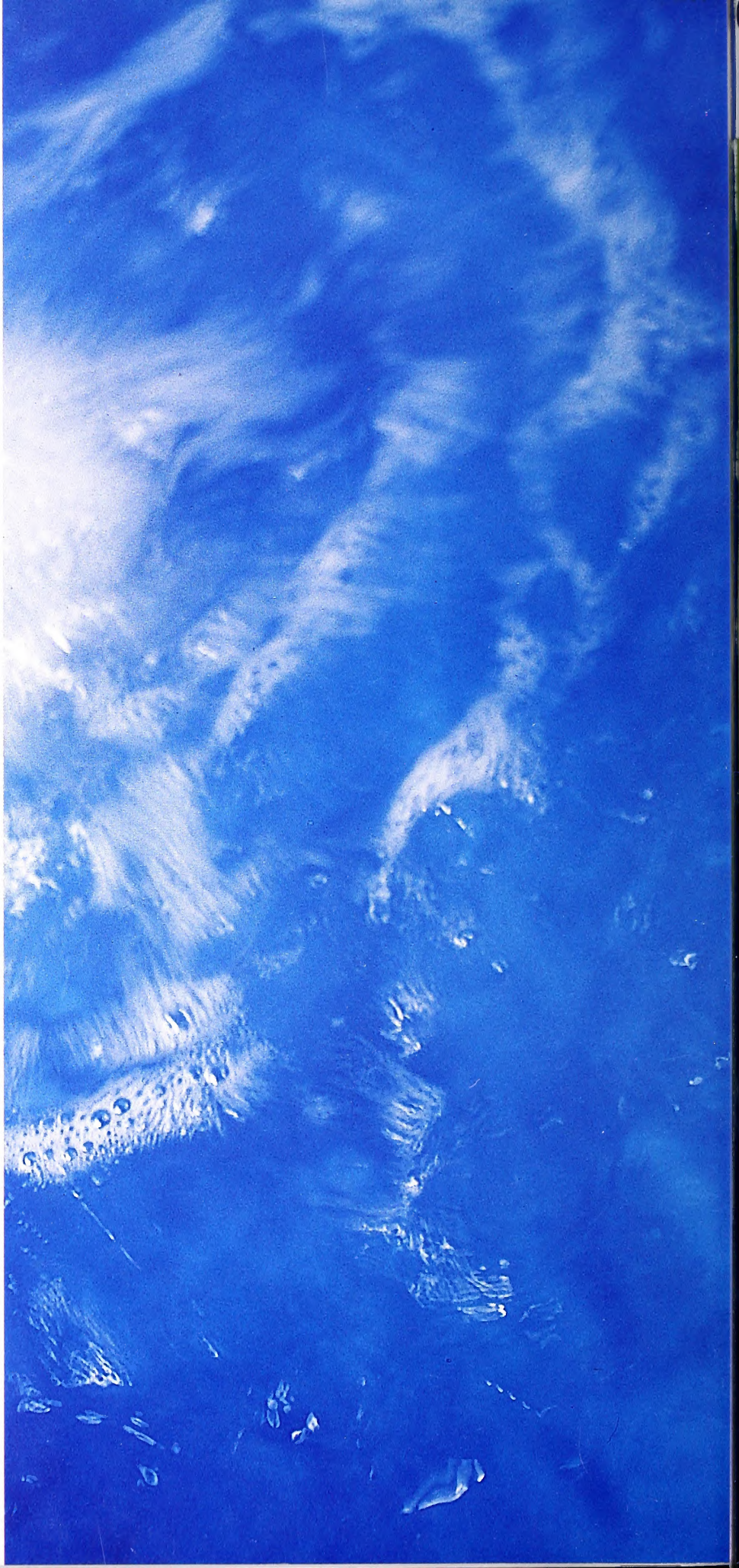
The seeds of some tree species, such as longleaf, pond, table mountain and pitch pine, actually need fire to germinate and thus regenerate the forest.

Clear-cutting

Sometimes thinning and burning is not enough to reach specific wildlife goals. Removing whole stands of timber allows the forest to start all over in a process ecologists call "succession." The earliest stages of succession are characterized by native tall grasses, briars, shrubs and fruiting plants. A number of animals thrive in early succession habitats. For example, quail and grouse depend upon the seeds provided by the early succession plants, and their poults feed upon the insects attracted to these areas. To maintain the overall diversity of habitats on game lands, small blocks of land are clear-cut.

MELISSA McGAW

Clear-cuts benefit small game especially.



On the Mend

Awaiting its return to the Atlantic Ocean, an injured green turtle recuperates in a tank at the Karen Beasley Sea Turtle Rescue and Rehabilitation Center. For more on sea turtle rescues, see page 10.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

C45;
T:67/9

WILDLIFE IN NORTH CAROLINA

SEPTEMBER 2003 $2.50

Ocean Pier Techies

by Jim Dean

JIM DEAN

"Only another pier fanatic will know all the many possibilities I'm leaving out."

It's part of the ritual of a summer beach vacation to take at least one leisurely stroll out to the end of an ocean pier, but it's probably fair to say that most anglers do not consider this serious fishing—hardly worth a sneer. As with many casual impressions, however, that assessment is flawed.

While the majority of ocean pier fishermen are merely hoping to catch a few fish for supper, there's another breed of pier fisherman. These dudes are seriously obsessed, supremely skilled anglers who fish a pier the way Buddy Rich played a drum—they beat the living heck out it, wringing out every possible rhythm.

To these anglers, a pier is a microcosm of the vast sea compressed into a strip possibly 1,000 yards long and no wider than the distance of two casts. On this watery chessboard, the challenges are ever-changing from the shorebreak all the way to the end. It is my opinion that few forms of fishing demand a broader knowledge of fish habits, or require more diverse and innovative tactical skills.

For one thing, master pier anglers are not chasing a single species of fish, but dozens. Indeed, they must be able to judge which species might afford the best opportunity at any given moment, and determine which tactics are most likely to catch them. They must be proficient with a wide variety of tackle, and have all of it on hand, rigged and ready. To make it even tougher, they must contend with quixotic seasonal migration patterns and the constant flux of weather and tide, which means that the rules of the game change daily, hourly, sometimes minute-to-minute.

You can easily distinguish these fishermen during your amble down the pier. They're the ones with big carts that hold multiple tackle boxes, coolers, cast nets, landing nets, live-bait baskets, aerated minnow buckets, flying gaffs and PVC holders bristling with rods that range from light spinning outfits to towering 12-foot anchor rods, Hatteras Heavers and stout boat rods hung with large revolving-spool reels crammed with monofilament.

Some ocean pier fishermen concentrate on one species, but the most proficient play the whole court, stalking the prey of the moment—be it mullet or mackerel. Hour after hour, they're observing, changing baits or lures, adjusting lines, trying this, trying that. Any fisherman with decent gear and a bit of luck can catch fish when the action is fast and furious, but it takes exceptional expertise and patience to milk the best from those languid days when fishing is poor.

Just for perspective, here's a partial list of the species available: flounder, spot, sea mullet, croaker, hogfish, pompano, spotted seatrout, gray trout, red drum, black drum, sheepshead, bluefish, Spanish mackerel, king mackerel, false albacore, cobia, shark and tarpon. Pier anglers must also know how to catch a variety of baits and keep them alive. It's all so astonishingly complex that Albert Einstein would have had a splitting headache before he'd ever caught his first pinfish.

I was once part of this fanatical fraternity. Throughout my high school and college years, I would arrive before dawn, gulp a cup of coffee, drag all my gear onto the pier, and fish until after dark. I did this for weeks, losing all track of time.

Typically, I'd start the day by catching a small bluefish and use a two-rod anchor rig to present this live bait off the end of the pier. While waiting for a king, cobia, tarpon or other big gamefish to strike, I might cast Gotcha-type plugs for bluefish or Spanish mackerel. We even made our own lures out of automobile radio antennas, ball-point pens and disposable razor handles. If big Spanish were reluctant to strike a lure, I might rig a small live thread herring on a tiny treble hook and free-float it under a small cork. If that didn't work, jigging a rig with bare gold hooks would sometimes entice Spanish to strike at the flash.

I'd also check out other options up and down the pier. Flounder, pompano, sea mullet and other species might be feeding under the shore break or in the slough. I learned which rigs and bait worked best for each species—live shrimp or small, live popeye mullet for flounders; live softshell mole crabs or bits of fresh shrimp for pompano and sea mullet. In late fall, I might try curly-tail jigs for trout and red drum, or see what might hit a plug just outside the sandbar. If I happened to see a big sheepshead around the pilings, I'd show it a small fiddler crab. Only another pier fanatic will know all the many possibilities I'm leaving out.

The game was constantly changing. Some days, nothing worked. More often, something did. But it was never low-tech—unless you wanted it to be.

N.C. DOCUMENTS CLEARINGHOUSE

SEP 1 8 2003

STATE LIBRARY OF NORTH CAROLINA RALEIGH

CONTENTS

WILDLIFE IN NORTH CAROLINA

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

September 2003

Volume 67, Number 9

page 2

FEATURES

2 **The Small Game Remedy**
written by Kate Pipkin and Terry Sharpe
Hopes remain high for a Wildlife Commission program designed to enhance small game habitat.

6 **On the Trail of Plant Poachers** *written by T. Edward Nickens*
photographed by Melissa McGaw
North Carolina is taking a lead role in the undercover effort to bust ginseng poachers.

12 **Blackwater Paddling Adventures** *written by John Manuel*
In the northeast corner of the state flow some of the most pristine paddling creeks you'll find.

16 **Advantages of an Alternative** *written by Gerald Almy*
Dove hunting alone or with a small group is often a refreshing, satisfying change.

20 **Hunting Season Roundup, 2003–2004**
Here's a quick look at North Carolina's major upcoming hunting seasons.

22 **Spotted: Sea Cows!** *written and photographed by Todd Pusser*
The Florida manatee sometimes summers in coastal North Carolina.

page 6

page 22

DEPARTMENTS

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Consie Powell* **28**
Back Porch *by Greg Jenkins* **32**
N.C. WILD Store **37**

Cover *A long-billed marsh wren proclaims its presence in a coastal freshwater marsh. Photograph by David S. Lee.*

page 28

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $12, three years $30, lifetime $150. All foreign subscriptions are $28 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376. **Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.**

D3980

The small game Remedy

Hopes remain high for a Wildlife Commission program designed to enhance small game habitat.

WRITTEN BY KATE PIPKIN AND TERRY SHARPE

Weedy or fallow fields, windrows, overgrown ditches, abandoned fields, unimproved pastures. Through the first half of the 20th century, all of those areas fulfilled the forage, cover and nesting needs of small game and non-game animals. But new technology and new ideas led to the advent of clean farming, with its larger equipment, more effective herbicides and fewer idle acres. Unused farmlands diminished, along with the wild populations that depend on old field habitat.

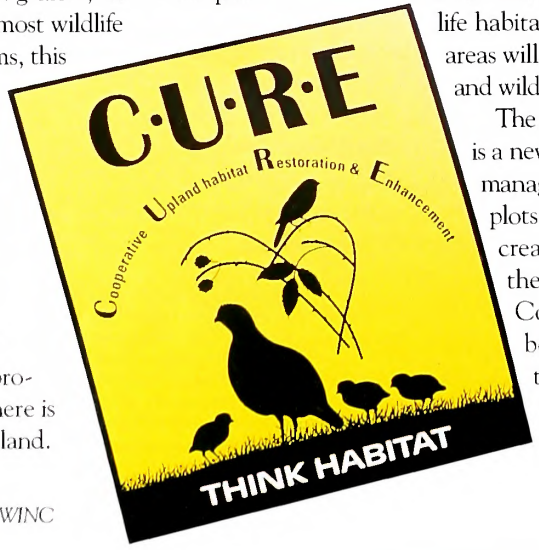
To stem the decline in bobwhite quail and associated species—rabbits, songbirds, prairie plants and others—the N.C. Wildlife Resources Commission developed the Cooperative Upland-habitat Restoration and Enhancement (CURE) program. CURE aims to increase early succession habitat (the transitional stage between field and forest, characterized by tall grasses, shrubs and pine seedlings). Unlike most wildlife restoration programs, this one started on private land. Wildlife Commission biologists realized that the problems of early succession habitat losses were bigger than the solutions public land could provide. Essentially, there is not enough public land. And not enough of it is suitable to make the dramatic changes needed to increase or stabilize the populations of these species.

So the Wildlife Commission turned toward a traditional habitat of these brush- and grass-loving animals—the farm.

THE CURE PROGRAM

Nothing on the horizon indicates that agriculture will revert to 19th-century practices. So the CURE program helps farmers incorporate wildlife-friendly landscape features without losing economic viability. With help from the commission, landowners on three large cooperatives across the state are creating shrubby field borders, replacing fescue with wildlife-friendly grasses and implementing forestry techniques to benefit wildlife over a five-year period. Through these pilot cooperatives, the commission intends to demonstrate that creating wildlife habitat in unproductive areas will benefit landowners and wildlife alike.

The cooperative approach is a new strategy. Past habitat management efforts—food plots and isolated habitat creation—did not stop the bobwhite's decline. Commission biologists believe habitat scale is the key to reversing the downward trend. Instead of isolated



MELISSA McGAW

A quail chick finds *cover under row crops on a game land field. The CURE program works to enhance small game populations on public and private lands.*

pockets of grassy or brushy habitat separated by extensive closed-canopy forests, the current effort aims to create 5,000-acre landscapes dominated by open habitats. These large-scale habitat blocks will discourage predators by giving small animals plenty of cover. Research shows that a landscape consisting of useable quail habitat is a common factor wherever quail populations flourish.

CURE on Public Lands

The commission has made a concerted effort to increase its management for early succession species on four carefully selected game lands. Suggs Mill Pond, Sandhills, Caswell and South Mountains game lands all had a small game component previously. But now, habitat parcels will be larger and wildlife management more focused. Staff at each of these game lands will develop a management plan that mirrors the plans developed for the private-lands phase of the CURE program. Biologists will count birds and measure vegetation plots using the same protocols for both the cooperatives and the game lands. Just like on private lands, the CURE areas on game lands will be closed to quail, grouse and woodcock hunting and dog training while the areas are under development. Like the private cooperatives, the CURE portion of each game land has almost 5,000 acres.

There are some important differences, however. The commission's work on public lands is open-ended, but private land work is subject to the time limits outlined in signed agreements. The landscape of the game lands is also very different: Game lands lack dwellings or large crop fields. Management crews have more freedom to pursue their preferred management strategies. Whereas on the private cooperatives only 10 to 12 percent of the total area will be converted to wildlife habitat, virtually all of a game land is wildlife habitat. Game lands also are typically more forested than private lands; so there will be much more cutting, thinning and burning than creating field borders or planting grasses along waterways. Because of the time required to plan and implement timber sales, CURE work on the game lands will get off to a slower start than on the private lands.

These plans probably excite avid quail, rabbit or grouse hunters. But other sportsmen or outdoor enthusiasts might worry about the impact this management will have upon the diversity of wildlife species on the game lands. Will these changes mean fewer deer? A more difficult hunt? What about interior-dwelling forest birds? These are valid questions.

KEN TAYLOR

Commission biologists carefully consider the impact of their actions on wildlife overall before starting on ambitious changes such as the CURE program. The forest management practices planned as part of CURE aim to enhance habitat for declining species and those underrepresented on the game lands, but not at the expense of other species. "We think we can achieve a healthy balance of habitats and wildlife on our game lands, and we hope North Carolinians will be patient through the early stages of the process," said David Cobb, chief of the commission's Division of Wildlife Management.

Sandhills Game Land

As Game Land Supervisor Lincoln Sadler and Wildlife Forester Bill Parsons drive through the Sandhills Game Land and contemplate the CURE program, they see the possibility of piggybacking CURE objectives onto the current thinning and burning regime.

The Sandhills Game Land is a remnant longleaf pine forest, a forest type once widespread through the Southeast. But its valuable, high-quality timber and sap made the longleaf too tempting for early European settlers. Currently less than 3 percent of the historic longleaf pine range is left. Slow-growing and fire-dependent, the longleaf pine is seldom replanted after it's cut. It is often replaced with loblolly pine or another commercially viable tree for the lumber and paper industry. But the wildlife benefits of properly managed longleaf stands are undeniable. From the endangered red-cockaded woodpecker to the pine snake, many species have adapted to the unique flora found in an open longleaf stand, even with its frequent fires. "We're confident the ground cover plants will respond to increased forest thinning and removal of hardwoods," Parsons said. "We should see wiregrass, bluestems and legumes before long. These plants will provide valuable structure and forage, particularly for ground-nesting birds."

Caswell Game Land

Located near Virginia, the Caswell Game Land is known more for its excellent turkey hunting than anything else. But 30 years ago, hunters likely heard the distinctive whistle *bob-white*, not a turkey's gobble. With the wild turkey securely in place, wildlife foresters Chris Kreh and Chris Dawes can focus on the habitat needs of the quail and its cohorts.

Caswell will probably receive the most dramatic makeover of any of the CURE game lands. Thick forests will be opened up, and prescribed burning will increase the number of ground-level plants and discourage the growth of saplings. Kreh and Dawes are cutting Virginia pine ridges and smaller stands of low-quality hardwoods. These areas will regenerate into habitat that has value to small game species and the birds that need shrubs, brambles and berry bushes, such as the field sparrow, prairie warbler and yellow-breasted chat. The foresters are also creating oak savannas by thinning and burning selected hardwood stands. Big-game hunters need not worry: New, tender leaves will attract deer, and wild turkeys will take advantage of the brushy habitat.

Suggs Mill Pond Game Land

Although many outdoor enthusiasts associate the Suggs Mill Pond Game Land in

Bladen County with its water features and wetland habitat, this game land can also be "CUREd." The Suggs crew has implemented this game land's most extensive prescribed burning regime to date—1,450 acres in the past two years. The hundreds of burned acres are reviving the forest floor.

Burning is a good start, but Ken Shughart, Suggs Mill Pond's supervisor, opened 73 acres by widening existing roads and trails to 60 feet in areas that are closed to vehicles. They will plant these openings with noninvasive species such as partridge pea and native warm-season grasses. Disking will occur on a three-year rotation. These areas will provide critical foraging, nesting and brood-rearing habitat for quail. And the resulting linear openings will also serve as fire breaks and hunter trails. Other species such as wild turkeys will benefit as well.

Shughart and Wildlife Forester Brent Wilson face a unique challenge on the Suggs CURE area—burning in and around Carolina bays of 100 acres or more. The impenetrable shrubs of the bays can be difficult to ignite. But once ablaze, these fires are often impossible to extinguish until the entire bay is consumed. The uplands on Suggs, which once supported parklike stands of longleaf pine, were clear-cut and planted to loblolly pine 20 years ago by a previous owner. Shughart and Wilson have taken advantage of the recent wet winter: They've enticed loggers to thin heavily 800 acres of small-diameter loblolly pine stands. The result will be open, savannalike stands. Frequent fires will maintain the forest in an open condition until the trees reach a profitable size. After the loblolly is harvested, these areas will be converted back to longleaf.

South Mountains Game Land

South Mountains in Rutherford County is one of the commission's newest and largest game lands. With elevations up to 3,000 feet, South Mountains is also the only CURE game land with grouse habitat potential. The commission inherited more than 2,000 acres of clearcuts when it took over the property. Although some land managers might consider that a deficit, Game Land Supervisor Chip Alexander and Wildlife Forester Dean Simon realized they could jump-start their CURE management in those clearcuts.

"We started by burning about 200 acres this year and will continue to on a two- to three-year burn rotation," Simon said. "South Mountains has great potential for early succession habitat, but management has been a technical challenge for us due to limited access and the rugged terrain in some areas. For areas we cannot safely burn, we decided herbicide application from the air via helicopter is the most practical and successful option available. Carefully planned herbicide applications can create and maintain the type of early succession wildlife habitat that is needed to achieve the management goals for this CURE area."

More Work Ahead

It's a challenge to open and maintain forests in early succession habitat. Burning, cutting, disking and spraying—the work never really ends. After their initial management activities, the crews can depend more heavily on fire to maintain the grassy ground cover. Starting out is the toughest part.

Recent research and management efforts have shown that quail, grassland songbirds and other small creatures respond to some destructive agents—forest fires and heavy timber harvests. For years those agents were unwelcome on public lands. Life (and biology) is funny that way. ⊠

Kate Pipkin is a Wildlife Commission outreach biologist. Terry Sharpe is an agricultural liaison biologist with the commission. E-mail comments to chris.powell@ncwildlife.org.

***Small game habitat** benefits from prescribed burns that reinvigorate forest floors. Field edges planted in warm-season grasses provide food and shelter for bobwhite quail and other animals. Nongame species like the prairie warbler, left, also profit from habitat restoration.*

MELISSA McGAW

VIC VENTERS

ON THE TRAIL OF PLANT POACHERS

NORTH CAROLINA IS TAKING A LEAD ROLE IN THE UNDERCOVER EFFORT TO BUST GINSENG POACHERS.

WRITTEN BY T. EDWARD NICKENS ■ PHOTOGRAPHED BY MELISSA MCGAW

Thunder grumbles over Cataloochee Divide, a 5,000-foot-tall ridge that snakes over the northeast corner of the Great Smoky Mountains National Park in North Carolina. Squatting at the base of a towering silverbell tree, Jim Corbin shakes his head sheepishly. As a plant protection specialist with the N.C. Department of Agriculture, Corbin spends countless days in the deep woods of the Southern Appalachians; he knows better than to leave his rain gear in the car. The first fat raindrops splat on a dense canopy of tulip poplar, red maple and black cherry trees, then drip onto a dazzling diversity of understory shrubs and flowers: black cohosh, New York fern, Solomon's seal, bloodroot, speckled wood lily, Jack-in-the-pulpit and Dutchman's pipe. And the coveted plant that Corbin holds between two dirt-stained fingers—American ginseng (*Panax quinquefolium*).

Corbin expertly scrapes away dirt from the plant's stem, exposing a gnarly, carrotlike root. He sprays it with two quick blasts from a can of aerosol drying agent, then pulls out a small pill bottle. Two taps of his left index finger is all it takes: A fine orange powder, bright as a hunter's safety hat, spills out of the bottle and onto the ginseng root. Corbin replaces the loamy soil and lightly tamps it down with his palm. "That's it," he says. "That plant is marked for a lifetime."

Marked and safe, Corbin hopes. Selling for $270 to $600 per pound of dried root, wild ginseng is one of the most sought-after species in an exploding international market for native plants (see sidebar). And it's the poster child for an interagency push designed to stymie the illegal poaching of those plants from public lands. In North Carolina and elsewhere, botanists are teaming up with law enforcement officers to attach sophisticated marking devices, both hidden and visible, to highly prized wild plants.

An hour after Corbin applies the customized—and environmentally safe—mixture of orange dye, gypsum and organic filler, the dye seeps deep into the ginseng root, permanently marking the tissues with blazes of orange. In addition, the powder contains color-coded silicon granules, each no larger than a coarse flour grain. When viewed under a 200-power microscope, those granules will tell law enforcement officials when the root was marked and where it was collected. Such a marking program works on two levels, Corbin explains. "Legitimate ginseng dealers won't accept dyed roots, because they know they were illegally harvested from the national park," he says. "And the silicon granules enable us to identify the plants in court."

Anyone can legally harvest ginseng from their private property and, with a permit, from most national forestlands. National parks, however, are off limits to plant collectors. Park managers are worried that as ginseng populations are increasingly being whittled down on private lands, collectors are turning to public lands. Ginseng poachers prize the protected and secluded hollows of national parks in particular, and have targeted both the Blue Ridge Parkway and the Great Smokies.

Increasingly, the plants they seek are being protected by countermeasures worthy of Cold War espionage. Along the Blue Ridge Parkway,

Sniffing for signs of American ginseng at a backwoods camp, Kira leads her handler, plant protection specialist Jim Corbin, to a ginseng dealer's stash. Ginseng stands are protected in national parks.

hidden electronics monitor stands of pitcher plants. Microtaggant™, a powdered marker developed for the explosives industry, is being used on the Blue Ridge Parkway for marking galax. In Arizona, Corbin's dye marker is used to combat the theft of petrified wood.

For law enforcement officials who have long relied on traditional—and time-consuming—surveillance techniques, the new technologies are a revelation. "The dye and silicon markers are as good as having a bar code on the plant," says John Garrison, a law enforcement specialist for the Blue Ridge Parkway. "Now we can say, 'These plants are the property of the U.S. government, no ifs, ands or buts.' "

The effect on poaching in the Great Smoky Mountains National Park, Garrison says, has been "dramatic." And the new technologies couldn't have come at a better time. In the Great Smokies, monitored ginseng plant populations are healthy, but only if they are protected from all harvesting. That's hardly the case. Park officials estimate that $5.3 million worth of ginseng roots were pilfered from the park in the last nine years alone.

American ginseng grows wild in a swath of eastern America that reaches from New York to Alabama, and as far west as Missouri. It's an inconspicuous herb, growing some 6 to 16 inches tall, with compound leaves formed of five serrated leaflets. Fond of shade and moist, rich woods, ginseng produces small, bright-red fruits gleaned by deer and wild turkey.

But it's the ginseng root that spawns human lust and greed. Wrinkled as an old man's face, a mature wild ginseng root grows long and tapered, often with arm- and leglike forks that give it the nickname "manroot." Ginseng has been used for centuries in Asia as an aphrodisiac and a general tonic, properties reflected in its genus name: *Panax,* which means "cure-all," as in "panacea." Native Americans used ginseng to treat coughs and fevers. Early settlers figured it for a dose of good spirits. *"It cheers the Heart even of a Man that has a bad wife,"* wrote Virginia's colonial governor, William Byrd. More recently, ginseng has been alleged to improve memory and lower cholesterol levels, no minor concerns for an aging American population.

Protecting wild ginseng is serious business to Jim Corbin, who marks plants from protected areas with a custom-mixed dye that penetrates deep into the root. Poachers who try to sell marked roots can be prosecuted, and the marked roots can be replanted in their place of origin.

WRINKLED AS AN OLD MAN'S FACE, A MATURE WILD GINSENG ROOT GROWS LONG AND TAPERED, OFTEN WITH ARM- AND LEGLIKE FORKS THAT GIVE IT THE NICKNAME "MANROOT."

AMERICAN GINSENG
(Panax quinquefolium)

Generations of North Carolina herb hunters have sought out the green leaf and red berry of American ginseng in rich, moist woods of the mountains and upper Piedmont. Its reputation as remedy, aphrodisiac and memory enhancer has boosted its value on the international plant market. Dried, the gnarly root of wild American ginseng is worth up to $600 a pound. Poachers have harvested millions of dollars' worth of ginseng from protected stands in national parks.

Each year, more than 2 million pounds of cultivated ginseng root is exported from the United States, but wild ginseng is held in far higher esteem by buyers. Cultivated roots are considered far less potent than plants dug from the wild and have a price tag of as little as $15 per pound. In 1999, nearly 66,000 pounds of wild ginseng root were harvested from the 19 states with federally approved programs for exporting the plant. Annual harvest totals are extremely volatile—the poundage of wild ginseng nearly doubled between 1988 and 1989—and driven by economic conditions as far away as Asia. In North Carolina, ginseng collecting, or "sanging," is part of mountain culture. "It's long been a traditional, walk-in-the-woods, make-a-little-extra-Christmas-money kind of thing," says Garrison. "For years, we could never get anyone to look at ginseng busts as anything but glorified flower-picking cases."

Then, within a 10-day period in 1993, surveillance teams in the Great Smokies arrested two different groups of ginseng poachers, each leaving the park with 13 pounds of ginseng root, the equivalent of about 8,000 plants. "That sent a shock wave through us," recalls Garrison.

In response, Corbin began devising ginseng markers in the basement of his home office, in a joint state-federal effort to transfer animal-marking technologies to plants. From tiny metallic strips written in Navajo—Corbin once was a missionary to western Navajo communities—the markers have evolved into the permanent dyes now used on thousands of wild ginseng plants in all corners of the Great Smokies.

The new marking efforts have allowed enforcement officials to rein in demand for park-pilfered ginseng. As legitimate dealers learn of the program and refuse to accept marked roots, poachers are being forced out of the park. And the initiative has allowed for the return of confiscated roots to their native lands. According to Janet Rock, a Great Smokies botanist, more than 7,000 marked plants have been seized and replanted.

Still, there's plenty of need for old-fashioned "man surveillance," says John Mattox, a Special Agent with the Great Smoky Mountains National Park. Rangers watch for the telltale signs of poachers in the woods. Local ginseng hunters most often dress in subdued-color clothing and wind up with soiled pants knees—"no bright yuppie jackets for them," Mattox says.

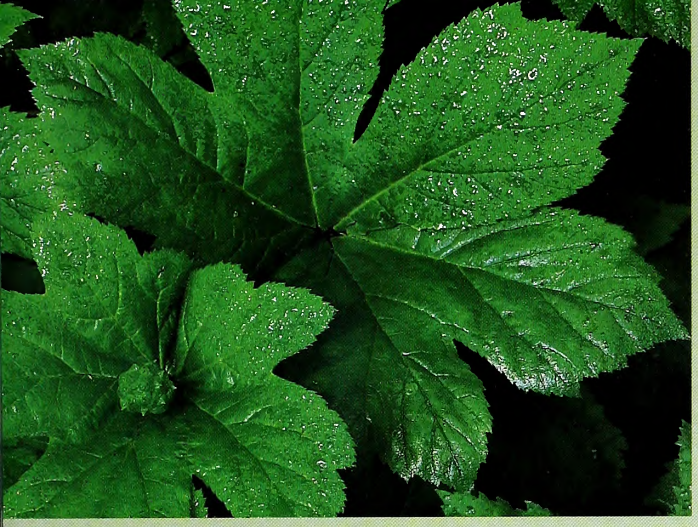
They also tend to slip out of the woods one by one, decoying rangers away from the poacher tapped to carry the group's roots out en masse. Other plant poachers have posed as wildflower photographers. Once, Garrison saw a car driven by a woman with a small child leaving the park just a few minutes after sunrise. "I said to myself, 'That can't be right,' " he recalls. He returned at the end of the day and arrested the woman's husband and father as she picked them up after a day of illegal ginseng harvesting.

Nearly 80 ginseng poachers have been convicted since the marking program began, but few doubt that poachers will continue to slip into the remote hollows, with a sharp stick and eyes searching for the five-leaved manroot. Corbin and his colleagues know they haven't devised a silver bullet out of orange dye and silicon.

"These poachers are not dumb," says Corbin. "We have to stay in front of them, which means we'll have to reinvent the wheel in a few years." And he grins like a man with a few tricks still up his sleeve. ⊠

BLACK COHOSH
(Cimicifuga racemosa)

■ Black cohosh is used to treat menopausal symptoms. Collection has skyrocketed as baby boomers age; in 1998, one Blue Ridge Parkway ranger seized 1,517 pounds of cohosh roots from a single pickup truck, picked by migrant workers who were subcontracted by another collector. Approximate value: $15 per dried pound.



GOLDENSEAL
(Hydrastis canadensis)

■ Goldenseal has seen myriad uses through the centuries as an insect repellent, laxative, antiseptic and masking agent for heroin addicts facing urine tests. Approximate value: $30 per dried pound.

BLOODROOT
(Sanguinaria canadensis)

■ Bloodroot is currently used in toothpaste and cattle feed. Native Americans and early settlers used bloodroot to treat snakebite, for coughs and as a medicine for sick mules. Approximate value: $15 per dried pound; $3 per gallon pot as an ornamental.

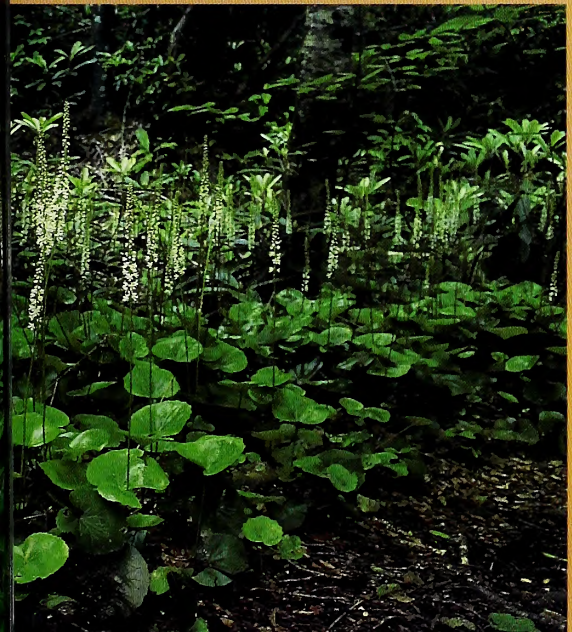
WILD BOUNTY GROWS ON THE FOREST FLOOR

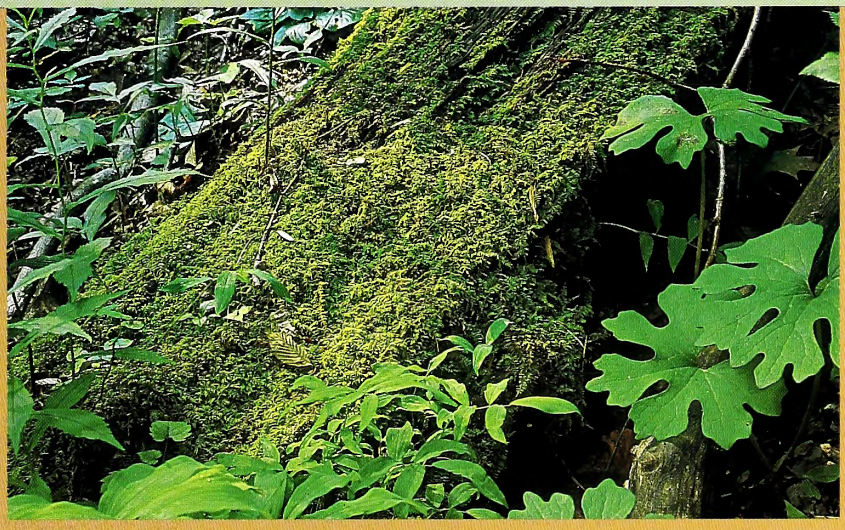
"The plant industry's move away from wild to cultivated sources of some rarer native North American medicinal plants should help to stabilize supply and remove harvest pressure from their wild populations," says Christoper S. Robbins of Traffic North America. "Still, despite greater efforts to prevent and punish offenses involving plant theft, the temptation to plunder valuable wild medicinal plants from protected areas in the United States still exists."

A single day's walk through the Southern Appalachian woods can result in a tidy sum. A haul of 1 pound of black cohosh, a quarter-pound of bloodroot, 1 pound of goldenseal, 1 pound of ginseng, a large feed sack of galax leaves and 10 pounds of log moss might net more than $700.

GALAX
(Galax aphylla)

■ Galax is collected year-round for the floral industry. More than 100,000 stems of illegally collected galax were seized along the Blue Ridge Parkway in the first six months of 2000. Approximate value: 1 cent per stem.





LOG MOSS
(Hypnum spp.)

■ Log moss is used for landscaping and in the floral business. Collectors roll moss off ancient fallen logs like carpet. Not long ago, officials confiscated a tractor-trailer truckload shipped from Tennessee to California. Approximate value: $16 per dried pound.

JODY DUGGINS

Blackwater
PADDLING ADVENTURES

In the northeast corner of the state flow some of the most pristine paddling creeks you'll find. **written by John Manuel**

Indiantown Creek is easily overlooked. Speeding through the farm country east of Elizabeth City, you cross over the tree-lined ribbon of water in a flash. If not for the brochure I'd picked up on a trip Down East, I would never have come out here. I would have missed out on a treasure trove of streams that I now look forward to exploring for years to come.

Back home in Durham, I opened the brochure entitled *Albemarle Region Canoe and Small Boat Trails System—Camden County*. Each of the five featured streams was described in a single paragraph worthy of Sgt. Joe Friday. "This trail begins as a drainage canal on SR 1148," read the opening sentence on Indiantown Creek. I was about to move on to the next entry when the words "traverses through magnificent hardwood and cypress swamps" and "adjacent to the Wildlife Resources Commission's Bear Sanctuary" caught my eye. I consulted my atlas and noted how Indiantown Creek wound from farmlands into an enormous swamp labeled "North River Game Land," a name I'd seen before.

MIKE DUNN

CHARLES STINE / TORTOISE RESERVE

Reading through *North Carolina Afield: A Guide to Nature Conservancy Projects in North Carolina*, I learned that the North River Game Land encompasses some 30,000 acres of pristine swamp forest and freshwater marsh, including some 90 acres of apparently virgin bald cypress and some of the state's last remaining stands of Atlantic white cedar. In 1997, The Nature Conservancy purchased 1,421 acres of cypress forest along Indiantown Creek and transferred it to the N.C. Wildlife Resources Commission for inclusion in the game land.

BLACKWATER CREEKS OF THE ALBEMARLE BRING PADDLERS UP CLOSE TO A GREAT DIVERSITY OF PLANTS AND ANIMALS, INCLUDING BLUE FLAG IRISES, TOP, AND A GREEN TREEFROG, BOTTOM.

A phone call to Merrill Lynch, conservation specialist with the North Carolina chapter of The Nature Conservancy, heightened my anticipation. Lynch informed me that the forests surrounding Indiantown Creek and the North River support some of the state's rarer neotropical songbirds, including breeding populations of black-throated green warblers, Swainson's warblers and worm-eating warblers, as well as a rare butterfly known as the Hessel's hairstreak, the larvae of which feed exclusively on Atlantic white cedar foliage. I knew better than to think I could actually identify any of these birds as they flitted through the forest. But the mention that the game land also serves as a vital corridor for animals such as black bears and bobcats was more than enough to get me out of my chair.

On a breezy morning in May, my canoeing partner, Dave, and I loaded up the car and headed for Indiantown Creek. Rather than putting in at the aforementioned drainage canal, Dave and I opted to launch the canoe at a public landing off Indiantown Road. We may have missed a couple of miles of superb scenery, but what we experienced in the next four hours far surpassed anything we'd imagined.

On most rivers, you have to paddle a good hundred yards from a public landing before you can escape the road noise and the bait boxes. On Indiantown Creek, the transformation from fishing hole to fantasy land was immediate. The cypress trees appeared around the first bend—big ones trailing long beards of Spanish moss. The dark water mirrored the brilliant understory of swamp tupelo and red maple. Indiantown Creek was just the size I like, about the width of a country road, with lots of twists and turns, each one offering the promise of surprise.

The first cottonmouth slithered out from under the alders on the right bank. You can tell the snake is a cottonmouth if it swims right out to take a look at you, spade-shaped head erect, wide body riding high. I aimed my camera. "Take me in, Dave," I said.

Dave shook his head. "I'm only gonna do this once for you, Johnny."

With silent strokes, Dave moved the canoe to within a few yards of the snake. I fired off two quick shots. "Perfect. Let's go."

The next bend held more surprises. Along with the usual complement of smooth-shelled yellowbelly sliders, a primitively armored snapping turtle sunned himself on a fat log. Snappers don't usually show themselves in daylight, giving credence to my feeling that Indiantown Creek is little traveled.

JODY DUGGINS

MELISSA McGAW

PADDLERS ARE LIKELY TO SPOT AN EASTERN COTTONMOUTH SNAKE SWIMMING HIGH IN THE WATER OR RESTING ON A LOW STREAMSIDE BRANCH.

Dave took out his spinning rod and tied on a plastic minnow. Like most streams in the Coastal Plain, Indiantown has waters stained dark by the tannin leaching out of the peaty soils. Dave decided to go with an oil-colored minnow to match the color of the water. Within minutes, he had a good-sized fish on the line. The fish made a few short runs, then ran out of steam. Dave lifted it into the air—head like a bass, tail like an eel—a bowfin.

We drifted for hours beneath the outstretched arms of cypress, finally arriving at a fork in the river that we determined to be Thoroughfare Island. It's possible to continue for another 9 to 10 miles, entering the wide North River and pulling out on the Intracoastal Waterway at Coinjock. But that's a long day, and potentially dangerous if the winds are up in the bay. We opted instead to turn around and head back to the bridge. Before doing so, Dave wanted to check out some suspicious tracks in the mud. He knelt down on the bank and measured with his hand.

"Bear," he said, holding his hand in the air, fingers spread wide. "Big one."

The tracks were a few days old, dried around the edges and dotted with cypress needles. But we couldn't help staring after them, wondering who might be watching us, and we imagined our excitement if we'd come paddling around the bend and met the bear face-to-face.

Indiantown is but one of 29 creeks identified by the Albemarle Resource Conservation and Development Council as part of the Albemarle Region Canoe and Small Boat Trails System. The selection and promotion of these trails were originally undertaken by Rodney Johnson, the council's project coordinator, and Tom Potter, then with the N.C. Division of Parks and Recreation. Starting in the 1980s, they convinced county commissioners in the 10 counties bordering the Albemarle Sound to adopt resolutions identifying some 200 miles of water on 29 different creeks as official canoe trails. Johnson and Potter then went about putting up signs (blue-and-white signs with a silhouette of two canoeists) identifying the trails, and publishing brochures to place in local travel and tourism offices.

The Albemarle trails have since been incorporated into a larger system of Coastal Plain paddle trails. The individual county brochures have been replaced by a single guide (the *North Carolina Coastal Plain Paddle Trails Guide*) published by the N.C. Division of Parks and Recreation and available free of charge at many county tourism offices. Maps can also be downloaded from the Web at http://ils.unc.edu/parkproject/nctrails.html.

Many paddlers are familiar with the canoe trails on the southern side of the Albemarle Sound, including the Roanoke River, Scuppernong River and Milltail Creek. However, relatively few people have explored the trails north of the sound. Johnson says his favorite trail is Moyock Creek (also known as Shingle Landing Creek) in Currituck County, just south of the Virginia line. "The trail starts out at a wooden camelback bridge in the town of Moyock, then enters a beautiful hardwood swamp," Johnson says. "Within a few miles, it intersects the Northwest River and passes into marshland that's full of wildlife."

Merrill Lynch says the marshes along the Northwest River are unique in the state by virtue of being tidally influenced yet containing purely fresh water. "Freshwater marshes support a much more diverse mosaic of vegetation than brackish or saltwater marshes," Lynch says. "You'll see plants like water lilies, hibiscus and wild iris all along the Northwest River. In winter, locals burn the marsh, and huge flocks of snow geese and tundra swans come in to root around for the tubers of these plants. In the summer, you'll see fairly unusual birds like king rails and least bitterns, along with the usual marsh wrens and red-winged blackbirds."

Joe Jacob, president of the N.C. Paddle Trails Association and co-owner of the outfitter and guide service Get Outdoors, Inc., likes Queen Anne's Creek and Pembroke Creek, two streams that flow into Edenton Bay. "We run a full-day trip up both of these creeks starting at the Historic Edenton waterfront," Jacobs says. "Queen Anne's is a short run, ideal for beginning paddlers. In the morning, we'll go up to the N.C. 32 bridge and back. Usually, we'll see osprey, kingfishers and heron. We have lunch in Edenton, then head up Pembroke Creek in the afternoon. In addition to the wading birds and birds of prey, we'll see mammals such as nutria and beaver. Our trip turns around at the U.S. 17 bridge, but you could spend a whole day going up to the headwaters and back."

On Indiantown Creek, THE TRANSFORMATION FROM FISHING HOLE TO FANTASY LAND WAS IMMEDIATE.

Wendy Jewett, director of Historic Hertford, Inc., likes paddling the upper Perquimans River. Hertford is a beautiful town located at the head of the tidewater section of the Perquimans. The town contains several structures dating to the 1700s and a lovely municipal park bordering the river. Jewett recommends putting in at Missing Mill Park and paddling upstream, where the river narrows.

"Very quickly, you'll get away from the houses and into a wild setting," Jewett says. "You'll see lots of cypress with hanging moss and a wide variety of bird life.

"I like to venture up into the side creeks," she says. "You can take a canal up to Winfall Landing, where they've set up picnic tables by the water."

Jewett says Perquimans County is working on a greenway plan to add more public access to the creeks and rivers. Theirs is just part of a regional effort to make canoe trails a central part of the ecotourism experience.

"We've now got annual paddle events on Pembroke and Queen Anne's creeks in Edenton and on the Cashie River in Windsor," Johnson says. "The Roanoke River Partners are hosting regular events on that river system. As time goes by, I think you're going to see a growing interest on the part of adventurous souls to explore these paddle trails."

Potecasi, Wiccacon, Yeopim, Areneuse . . . the list of names goes on and on. I picture the creeks winding between pillars of cypress, wood ducks and red-shouldered hawks taking flight in front of my canoe. And always, there's the hope of coming round the corner and meeting a bobcat or a bear prowling the edge of one of these beautiful streams. ⊠

JODY DUGGINS

KAYAKS SWIFTLY TRANSPORT WILDLIFE WATCHERS TRAVELING WELL-MARKED CANOE TRAILS.

KEN TAYLOR

ADVANTAGES OF AN ALTERNATIVE

DOVE HUNTING ALONE OR WITH A SMALL GROUP IS OFTEN A REFRESHING, SATISFYING CHANGE.

WRITTEN BY **GERALD ALMY**

It caught my eye immediately as I drove around that September afternoon. It was the type of farm you don't see much these days. It was small—possibly run by a family that had other jobs on the side—and it had some habitat. Clearly, these people had neither the time nor the inclination to clear every weed from every fence post and convert every brushy corner and hedgerow into cropland. There was cover, and yet there were crops, too—corn, mostly, some of it cut, some uncut.

The largest field was perhaps 5 acres, and it was broken by a row of brush before it joined another small field. There was a finger of rocks, brush and saplings jutting out into that second field. *A perfect spot for a dove stand,* I thought. A short time watching beside the dirt road confirmed that. The harvesting hadn't been an especially neat job, and stray ears and kernels of the yellow grain were attracting the birds. Another nearby weedy, fallow field also provided seeds for the mourning doves, and a pond tucked away in a low spot offered water. Several large trees, a couple of them stone dead, made good places to perch between feeding and watering. Just across the road, a grove of cedars gave the birds a nice spot for roosting.

All told, the farm probably didn't cover more than 20 acres. But to someone like me who prefers to hunt doves either alone or with a friend or two, it was like stumbling upon a treasure. Now my only fear was that the landowner wouldn't want to let a stranger like me enjoy it. I couldn't blame him a bit if that was his choice, but I swallowed hard, mustered up my courage and knocked on the door anyway. After a few pleasantries, permission was granted.

I knew it helped that it was the third week into the season and "dove mania" had died down since Opening Day. Only a few diehards were still out looking for this fleet-winged gray quarry. It was also a plus that I was by myself. There would be no crowds swarming onto his fields, no cars parked all over and no shotgun blasts all afternoon. Just a single hunter and a few 20-gauge loads fired occasionally, if luck was with me.

It was. Before I had even grabbed my vest and gun and headed out, I saw doves sitting in a scraggly, dead elm tree. Then another small flock swooped down into the nearest field and landed with a light whistling of wings.

N.C. WILDLIFE RESOURCES COMMISSION

***Pare a dove hunt down** to its simplest elements for an enjoyable day afield.*

***A few well-placed** decoys and a carefully selected shooting spot can help make dove hunting solo or in small groups successful.*

I knew I couldn't just rush in and scatter all the doves, so I eased out behind a hedgerow into an adjacent overgrown field, then worked my way out along a brushy point jutting into the grain field and took a stand near a cedar. Settling down, I loaded up the side-by-side 20-gauge Winchester with No. 8 shells and watched.

The wait was a short one. Almost immediately, a flock of four doves glided in, and I took one cleanly with the first barrel, missing with my second shot. The flights came in waves, followed by brief lulls. Twice, I tried to go pick up fallen birds and had others zoom overhead. The limit came almost too quickly that afternoon. Soon, I was stopping by to thank the farmer and heading home.

UNTRADITIONAL, BUT SATISFYING

That may seem like an unusual dove hunt if you are used to the traditional way these birds are hunted. Most hunters picture dove shoots as big, crowded social affairs. Sometimes dozens of hunters gather at a large farm and spread out around the perimeter of specially managed fields. Lots of good-natured ribbing and shouting back and forth take place, and there are festive meals before or after the shoot.

Certainly this type of event has its appeal. But over the years I've mostly enjoyed a different type of hunting for this fast-flying game bird. I hunt them either alone or with a couple of friends. In spite of what you may have been told or read, excellent dove sport is possible without a crowd of hunters to "keep the birds flying."

And if the truth be known, you'll come away from a solo or small group dove hunt feeling more like you've really been hunting than just participating in a big social shoot.

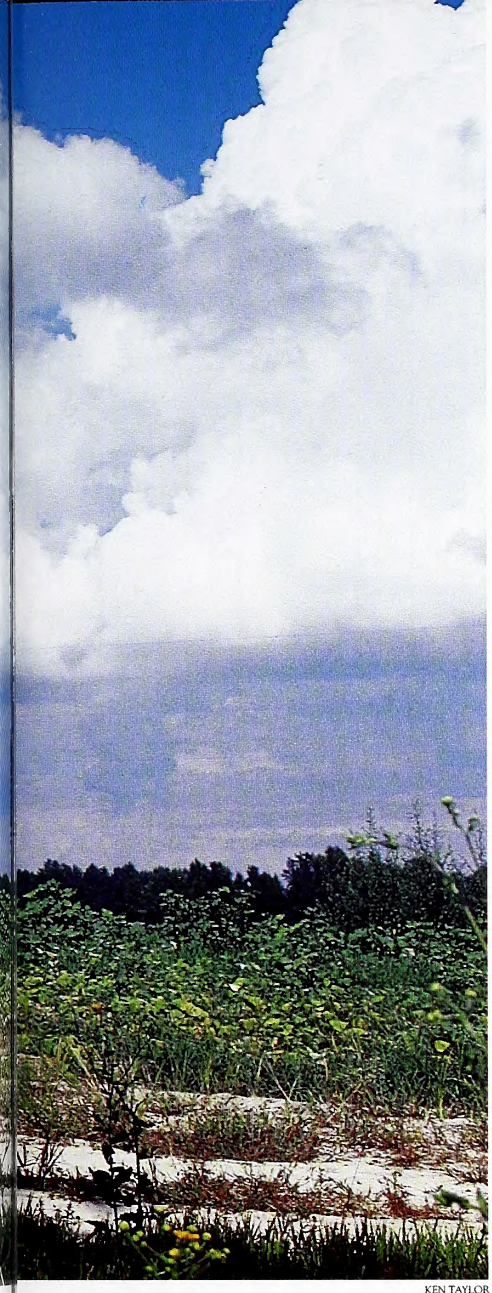
One of the biggest advantages of hunting doves with a small group or alone is the ability to obtain permission more easily, as I found out on my enjoyable hunt at the small farm. Another thing is that you don't need to find huge concentrations of birds. A small grain field or cutover being used by a few dozen doves will suit just fine. A major flight and hundreds of birds aren't necessary.

Though you don't need a lot of doves, a bit of scouting is required for a successful solo or small group hunt. You need to get out—preferably before the season and then again shortly before you hunt—to pinpoint flocks, find out the flight paths birds are taking and obtain permission from the landowner. Then a last-minute check is in order to be sure conditions haven't changed or the birds haven't moved to another field. You'll find, though, that with just a few shooters involved, fields aren't "burned out" as quickly as they are when a large social hunt takes place.

SUBTLETY AND THOROUGHNESS PAY

Hunting doves after Opening Day with a few gunners is a bit like hunting deer by studying their natural habitat and movement patterns, then intercepting them in their normal routes of travel. It's like the opposite of choosing a random stand and hoping the large number of hunters in the woods will drive a buck past you. It takes more time, effort and strategy to waylay the quarry in its natural patterns of activity, but the feeling of accomplishment is much greater than when simply overwhelming a game species by sheer numbers.

Travel back roads in a location with farms and wood lots. Park where you can see a large area, perhaps from a hill. Then simply watch. Look for cut grain fields, fallow fields with weed seeds such as thistle and croton, timber cutovers and other areas that might offer food. Use your naked eyes and binoculars to watch for flights of birds. Corn, wheat, sunflower, millet, milo, sorghum, soybeans and peanuts can all draw in doves. Try to find places with a few dead trees, some hedgerows, perhaps a point of untilled land jutting out into the field, preferably a pond nearby and evergreens for roosting. As you look for doves, also pinpoint likely stand spots such as a lone tree along a fence, a gap in a tree line, a clump of cedars you could hide next to for cover, or a section of uncut corn.



KEN TAYLOR

The better your site meets the needs of doves, the more likely you'll have a productive hunt. Avoid large agricultural spreads: It's harder to get permission to hunt those acreages, and it's tough for one or two hunters to cover big fields effectively. With small fields, the birds are concentrated in a tighter area and are more likely to fly close to you or your partner when entering or leaving the feeding area.

CHANGING TACTICS

One of the nice things about hunting doves solo or with a couple of friends is that you can move if the first spot you choose isn't productive or if it cools down after a while. In fact, it can be a tactical advantage to move occasionally. The doves may sense where the shooting is coming from and start flying in on a different route. Always be on the alert for such changes in flight patterns, and don't be hesitant about moving to a new spot. I occasionally move two or three times during the course of a hunt to keep the birds unsure about where I am. If you can bag a couple of doves at each location, before you know it, you're close to your limit.

*A **feeling of** accomplishment comes with a productive hunt that has been planned and executed with attention to detail.*

Another tactic you can use is jump shooting. If doves have flown into a field, they may simply stay there gorging until they are full, then fly out, offering little opportunity for shooting. Try to use dips in the field or humps to keep the birds from seeing you, and hunch down to stay low. Then stalk them. Sometimes you'll be able to sneak into shooting range. And even if you don't, there's a good chance you'll flush them past your friends or get return shots when the birds filter back in over the next half hour or so.

Another tactic that sometimes works is for two or three hunters to walk parallel through a field. You may flush birds past your partners; or if you have another person at the end of the field, that hunter may get shots as the birds fly away from the walkers.

The best choke for solo and small-group dove hunting varies with the cover involved and the flight patterns of the birds. I like double barrels, and the standard improved-cylinder/modified combination is hard to beat for most dove hunting. If you have to select one choke for a pump, autoloader or single shot, I would lean toward improved, with a screw-in modified choke on hand if birds are flying further than you expected. Use a skeet or open bore if they are coming by really close—25 yards or less. Any gauge from 12 to 28 will work, and No. 7 or 8 shot is best.

Sure, large-scale social dove shoots are fun for the camaraderie and festivities that accompany them. But don't overlook the excellent dove hunting opportunities that are out there for the lone hunter or small group. By yourself or with a friend or two, you can enjoy great sport by concentrating on small farms, scouting before the hunt, picking stand sites carefully and employing nontraditional tactics like jump shooting and changing stand locations. And when you outsmart the doves instead of outnumbering them, the satisfaction runs especially deep. ⊠

MELISSA McGAW

EXTRA GEAR FOR DOVE HUNTS

Besides gun and shells, other gear you should bring on a dove hunt includes sunscreen, a hat with a brim, drinks, shooting glasses or sunglasses, earplugs, insect repellent, a folding stool or 10-gallon paint bucket painted a drab color, binoculars, and perhaps a few decoys to place in trees or on a fence wire.

CARE OF HARVESTED DOVES

To make sure you wind up with the best table fare, a few simple steps should be followed on a dove hunt. First of all, don't pile the birds on top of each other in the back of a vest in a game pouch. Their body heat can't dissipate that way, and they may start to spoil.

Instead, spread them out in the shade so they can cool down. Alternately, you can place them on ice in a cooler. You can partially field dress them, but federal law requires that you leave one fully feathered wing on each bird for identification.

Once you're home you can either pluck doves and remove the feet, wings, head and intestines, or you can debreast them. Wash the birds, then store in the refrigerator until you're ready to cook them, or double wrap and freeze for later meals.

Doves can be fried, barbequed, broiled or baked. The meat is dark yet delicate and richly flavored. You won't find anything like it in a grocery store, that's for sure.

NORTH CAROLINA
Hunting Seasons 2003–2004

Species	Hunting Season	Daily Limit	Possession	Season
CROW	Thurs., Fri., Sat. of each week from June 1 through the last day of February plus Labor Day and Christmas Day (Seasons shown are valid through June 30, 2004.)	No restriction		
DOVE	Sept. 1–Oct. 4 (noon through sunset from Sept. 2 through Sept. 7; thereafter, shooting hours are 1/2 hour before sunrise to sunset.) Nov. 24–Nov. 29 Dec. 17–Jan. 15 (Shooting hours are from 1/2 hour before sunrise until sunset during Nov. 24–29 & Dec. 17–Jan. 15 seasons.)	12	24	None
RAILS, MOORHENS & GALLINULES				
Moorhen and Gallinule	Sept. 1–Nov. 8	15	30	None
Clapper Rail, King Rail	Sept. 1–Nov. 8	15	30	None
Sora Rail, Virginia Rail	Sept. 1–Nov. 8	25	25	None
CANADA GEESE	Sept. 2–Sept. 30 (except N.E. counties)[1] Sept. 1–Sept. 20 (N.E. counties)[1]	5 *(except for Dare and Currituck counties where limit is 2)*	10 *(except for Dare and Currituck where limit is 4)*	None
EARLY TEAL SEASON	Sept. 13–Sept. 20 (east of US 17 Only)[1]	4	8	None
MIGRATORY WATERFOWL	Federal regulations may be obtained at www.ncwildlife.org or by calling toll free (800) 675-0263 after Labor Day.			
DEER		2	6[2]	6[2]
Bow and Arrow	Sept. 13–Oct. 10 (Eastern)[3] Sept. 8–Oct. 4 and Oct. 13–Nov. 22 (Western)[3] Sept. 13–Nov. 7 (Central)[3] Sept. 13–Nov. 14 (Northwestern)			
Muzzleloading	Oct. 11–Oct. 17 (Eastern)[3] Oct. 6–Oct. 111 (Western) Nov. 8–Nov. 14 (Central)[3] Nov. 15–Nov. 21 (Northwestern)			
Gun	Oct. 18–Jan. 1 (Eastern)[3] Nov. 24–Dec. 13 (Western)[3] Nov. 15–Jan. 1 (Central)[3] Nov. 22–Dec. 19 (Northwestern)[3]			
Gun, Either Sex and Special, Either Sex	See 2003–2004 North Carolina Inland Fishing, Hunting and Trapping Regulations Digest			

Special, Either Sex	Trapping Regulations Digest			
BLACK BEAR	See *Regulations Digest*	1	1	1
WILD BOAR	Oct. 13–Nov. 22 and Dec. 15–Jan. 1	1	1	2
RED & GRAY SQUIRREL	Oct. 13–Jan. 31	8[4]	16	75
FOX SQUIRREL	Oct. 13–Dec. 31 (only in 20 counties; season closed elsewhere; see *Regulations Digest*)	1[4]	2	10
COMMON SNIPE	Nov. 14–Feb. 28	8	16	None
QUAIL	Nov. 22–Feb. 28	6	12	None
RUFFED GROUSE	Oct. 13–Feb. 28	3	6	30
RACCOON & OPOSSUM	Oct. 13 (sunrise)–Feb. 28	No restriction on opossum (See *Regulations Digest* for bag limits on raccoon.)		
RABBIT	Nov. 22–Feb. 28	5	10	75
—Box Trapping	Nov. 22–Feb. 28			
PHEASANT—Non-native Male Pheasant Only	Nov. 22–Feb. 1	3	6	30
WOODCOCK	Dec. 17–Jan. 15	3	6	None
BOBCAT	Oct. 13–Feb. 28[5]	No restriction		
FOX	See *Regulations Digest*			
GROUNDHOG	No closed season or bag limits			
COYOTE	No closed season or bag limits			
NUTRIA	No closed season or bag limits (except Currituck County, see *Regulations Digest*)			
WILD TURKEY	April 10–May 8[6]	1	2	*(Annual bag limit: Two birds, only one of which may be taken during the winter either-sex wild turkey season.)*
Bearded Turkey Only	(except Wilson County, see *Regulations Digest*)			
Either Sex	Jan. 12–17 (See *Regulations Digest* for counties.)	*1*	*1*	

[1] Counties in the Northeast Hunt Unit are: Bertie (that portion that is both west of Highway 17 and east of Highway 13 and that portion that is east of Highway 45), Camden, Chowan, Currituck, Dare, Hyde, Northampton (that portion that is both north of Highway 158 and east of Highway 35), Pasquotank, Perquimans, Tyrrell and Washington.

[2] See *2003–2004 North Carolina Inland Fishing, Hunting & Trapping Regulations Digest* for buck bag limits.

[3] See *Regulations Digest* for approximate boundaries of Eastern, Central, Northwestern and Western deer seasons. For a copy of the *Digest*, write: N.C. Wildlife Resources Commission, 1722 Mail Service Center, Raleigh, NC 27699-1722.

[4] Total limit of 8 squirrels per day of which one can be a fox squirrel in counties having an open fox squirrel season.

[5] The bobcat season is closed in the Harmon Den and Sherwood bear sanctuaries in Haywood County.

[6] See *2003–2004 Regulations Digest* for counties open to turkey hunting.

SPOTTED: *Sea Cows!*

WRITTEN AND PHOTOGRAPHED *by Todd Pusser*

The Florida MANATEE *sometimes* SUMMERS *in coastal* NORTH CAROLINA.

Slowly, the large shape materialized out of the murky green water and approached to within 2 feet of where I was floating. I was a bit apprehensive at first. After all, just inches in front of my face swam an animal that was larger than my living room sofa and weighed half a ton. The manatee swam closer still, as if inviting me to reach out and give it a scratch on the back. I extended my hand ever so slowly and gently scratched the manatee. Like an eager puppy, the large marine mammal turned around, eyes rolling back in its head, and actually leaned into my hand, wanting to be scratched more. Realizing that I had nothing to fear, I spent the next two hours swimming and enjoying the company of this manatee and others nearby.

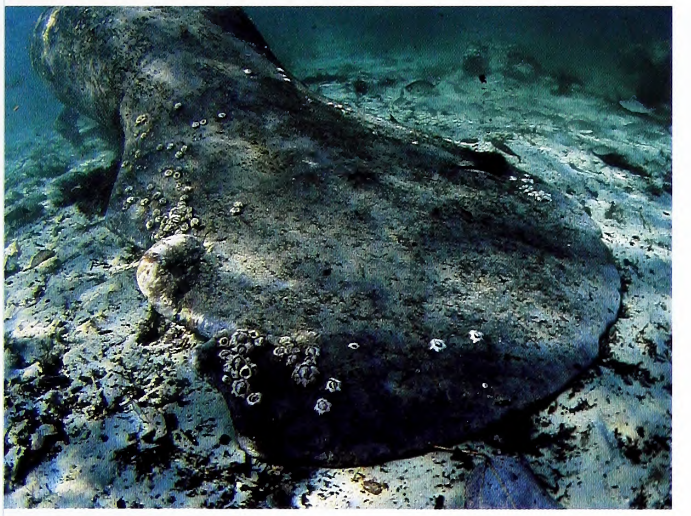
I will never forget that first encounter with these large, docile creatures. I went to Crystal River, along the west coast of Florida, as part of my scuba-diving class at the University of North Carolina at Chapel Hill more than 10 years ago. The manatees of Crystal River left an indelible mark in my mind and encouraged me to pursue a career in marine biology.

***Manatees love the** clear warm waters of Florida, but an instinct to expand their range may lead them to visit coastal North Carolina. (Manatees shown are in Florida waters.)*

I was surprised to learn recently that manatees also come to visit me—or at least my home waters. An increasing number of reported sightings indicate that manatees enter the coastal waters of our state frequently. In fact, they are not as uncommon in North Carolina waters as one might think.

The Florida manatee (*Trichechus manatus*), a subspecies of the West Indian manatee, inhabits coastal waters, estuaries and rivers throughout the southeastern United States, with the greatest number recorded in Florida. During summer months, an unknown number of the population move north along the east coast of Florida into coastal Georgia and the Carolinas. Some have been recorded as far north as Rhode Island. In North Carolina, manatees have been recorded in every coastal county, primarily between the months of May and October. Sightings are reported each year in the state, mainly in the coastal sounds and around the mouths of major rivers.

Larisa Avens, a sea turtle researcher based in Beaufort with the National Oceanographic and Atmospheric Administration, was out checking pound nets with a Carteret County fisherman in Core Sound on June 13 of this year. They were looking for stranded turtles but instead found a juvenile manatee swimming inside a 20-by-20-foot net.



***These large** marine mammals have been spotted in every coastal county in the state. With a broad, flat tail to provide swimming power, manatees have the ability to travel great distances in fairly short periods of time.*

"We approached the net, and to my surprise, I saw this snout poking out of the water," Avens said. "The manatee appeared to be a juvenile. He was about 8 feet long and slender. We watched him for about 20 minutes, then we dipped the side of the net down, and he swam away."

Aquatic Bovines The manatee belongs to the order Sirenia. Only four species of Sirenia exist: the Amazonian manatee (*Trichechus inunguis*) of the Amazon River and its tributaries; the West African manatee (*T. senegalensis*), found along the west coast of Africa; the Dugong (*Dugong dugon*) of the tropical Indo-Pacific oceans; and the West Indian manatee, with its Florida and Antillean subspecies.

Like all mammals, manatees give birth to live young, produce milk, have hair and must surface to breathe. Members of this order are fully aquatic, but their closest living relatives are land-dwelling mammals such as elephants and aardvarks. An adult Florida manatee averages 10 feet in length and weighs 800 to 1,200 pounds. Large adults can grow to 13 feet and 3,500 pounds. Females are generally larger than males.

Manatees have a torpedo-shaped body with no hind limbs. They propel themselves with a broad, paddle-shaped tail and maneuver with two modified forelimbs known as pectoral flippers. A manatee has thick and rough skin like an elephant's, with sparse hairs evenly distributed across its body, and brushy whiskers known as vibrissae on its large, flexible upper lip. As odd as it sounds, considering the marine mammal's size and ungainly appearance, it is believed that manatee sightings by sailors of old inspired tales of mermaids.

Nicknamed "sea cow" for good reason, manatees are herbivores and feed on sea grass and aquatic plants. Their teeth consist only of molars, which they use for grinding plant material. Teeth are continually replaced throughout the manatee's life, which can last as long as 70 years.

An Urge to Explore Once the ocean water begins to warm up in the late spring, some manatees feel the need to explore. Mike Bryant, manager of the Alligator River National Wildlife Refuge, said many animals have an instinct to disperse and expand their range as far as they can. "They like to test the waters, so to speak," Bryant said. "Nature sets the limits."

Manatees have a low tolerance for cold water. Because they possess no blubber layer like that of whales and dolphins, their thick skin and thin fat layer provide inadequate insulation against the cold. And since their metabolic rate is lower than that of other mammals of similar size, manatees can die of hypothermia within a few hours of exposure to cold water. They generally will migrate toward a warmer climate when the water temperature reaches 68 degrees.

This explains why manatees are seen in North Carolina only during balmy months. There has been only one documented live manatee sighting in the state between the end of October and the beginning of April. Manatees appear to dawdle a bit: They make sure the water is warm enough to venture north in the spring, and they wait until the ocean begins to get chilly to migrate south.

The biggest dawdler and most prolific traveler on record is "Chessie," a manatee that made headlines in 1994. When Chessie was spotted in the Chesapeake Bay in September of that year, scientists worried that the cool waters might harm him. They captured the wayward manatee and airlifted him to Florida, where he was released after being fitted with a radio tag monitored by a satellite.

Chessie swam around the waters of South Florida that winter, then made a beeline north as water temperatures rose in the spring of 1995. He swam through North Carolina waters and continued his journey north back into Chesapeake Bay, but didn't stop

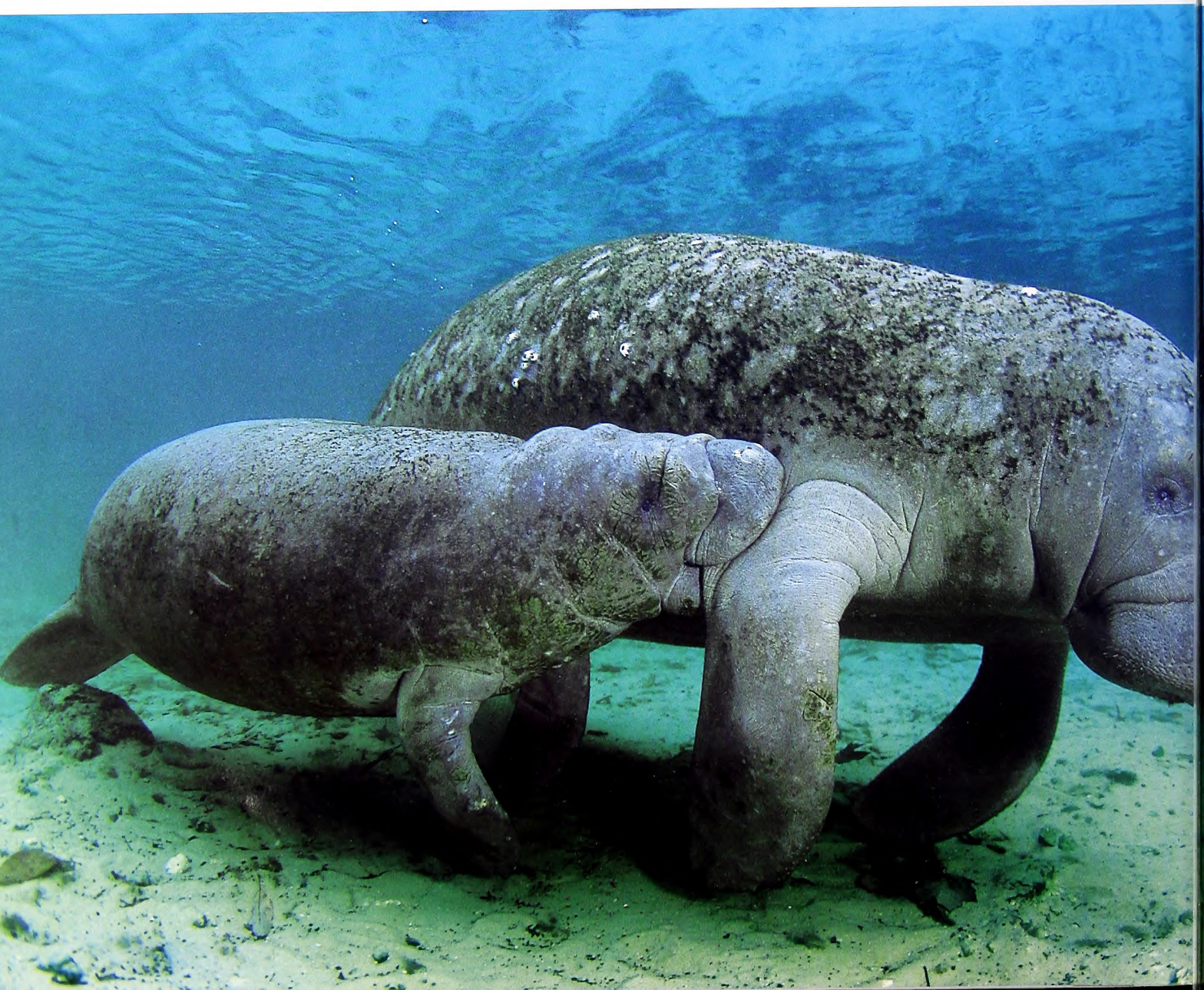
there. Chessie continued to swim north through Delaware Bay, into the coastal waters of New Jersey and Connecticut, within eyesight of the Statue of Liberty in Long Island Sound, and eventually to Point Judith off Rhode Island. Then he turned around and swam back to Florida.

"Chessie is a wonderful example of a manatee testing the waters," said Jim Valade, a manatee expert with the U.S. Fish and Wildlife Service in Jacksonville, Fla. "Manatees are incredibly opportunistic. They are driven by food and fresh water. With all the rivers flowing to the coast, and the protected sounds inside the barrier islands, North Carolina is wonderful habitat for manatees."

Counting Sea Cows Although few North Carolinians have seen manatees in the wild, the number of sightings appears to be increasing. Researcher Frank J. Schwartz of the UNC Institute of Marine Sciences reported in a 1995 study that 68 Florida manatees had been spotted in 59 different sites. Schwartz's report covered a period from 1994 back to the first report of a manatee in North Carolina waters—a sighting in Masonboro Sound near Wilmington in September 1919 recorded by C.S. Brimley, an accomplished naturalist at the N.C. Department of Agriculture. There are just 10 records from 1919 to 1980, when Schwartz initiated his study. After that, the study lists only three years without a confirmed manatee sighting.

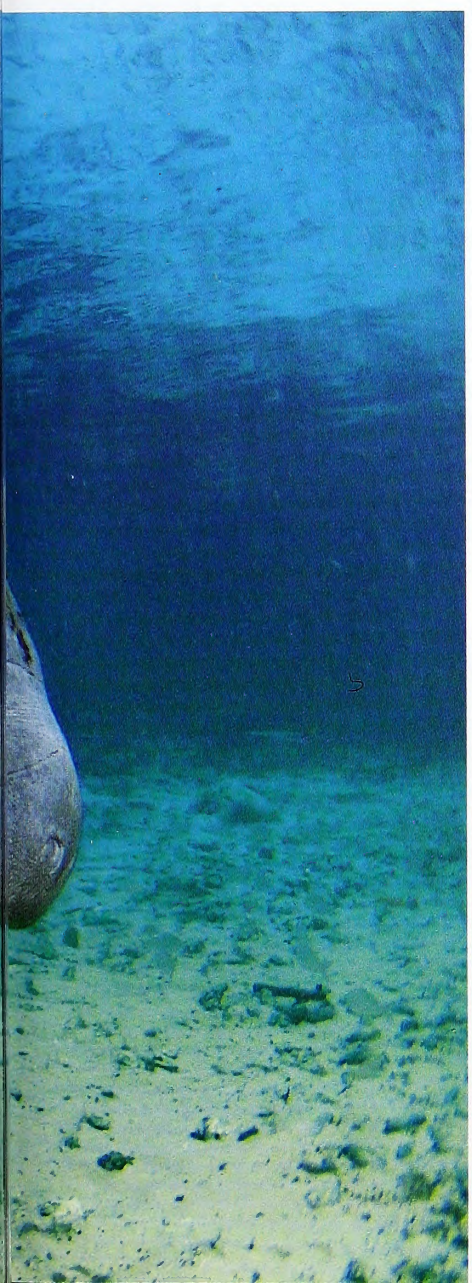
Reports come in from all areas of the state's coast, but the majority of manatee sightings are made in Coastal Plain rivers, where the animals feed on plentiful aquatic vegetation. Boaters have reported numerous sightings in the Trent, Neuse, Pamlico and Cape Fear rivers. Some have been reported quite far inland, such as in the Tar River near Washington and Greenville. One was even seen slurping down fresh water from a running water hose that boaters left dangling from a dock along the Intracoastal Waterway.

The waters around Wilmington seem to attract manatees. Conditions at the mouth of the Cape Fear are similar to manatee habitats in Florida's coastal rivers. On June 16, just three days after Avens freed the manatee in the Core Sound pound net, two manatees were spotted in the Lee's Cut/Banks Channel area on the Intracoastal Waterway side of Wrightsville Beach. Seaman Apprentice Daniel Darnell of the U.S. Coast Guard Station at Wrightsville Beach didn't see those two, but he saw one a year ago underneath the station's pier. He observed the manatee closely enough to notice that it had scars on its back that appeared to have been made by boat propellers.



What to Do If You See a Manatee

- Leave it alone: Although manatees have a reputation for being friendly and docile, treat it as you would any other wild animal in its habitat. Do not bother the animal or try to feed it.
- Report its presence: Call your local wildlife enforcement officer and ask them to contact biologist John Hammond of the U.S. Fish and Wildlife Service at (919) 856-4520, Ext. 28. Hammond keeps a list of all manatee sightings in North Carolina.
- Enjoy a unique opportunity: Sightings are still fairly uncommon, so if you see one, take advantage. Watch the manatee as long as you like from the shore or a boat and take photos if you like. Then leave it be.



Like all mammals, *manatees nurse their young. Many of the manatees spotted on the Carolina coast are juveniles.*

Why the sudden increase in sightings during the last 10 to 20 years? It would be natural to assume that because the manatee has been listed as an endangered species since 1973, the population might be increasing. Experts agree that the Florida populations seem to be increasing very slowly, but not at a rate as great as the increase in sightings. It is likely that since public awareness has been raised by activist groups such as the Save the Manatee Club, people are better educated about manatees and are more likely to report sightings. Historical accounts suggest that manatees have visited the waters of the mid-Atlantic states for years. Europeans who arrived at the shores of the Chesapeake Bay in Virginia during the 16th century reported encounters with manatees.

Amiable and Unafraid Manatees have no natural enemies, with the possible exception of ignorant humans. The greatest threats they face are habitat degradation, entanglement with fishing gear and collisions with motorboats—all problems caused by people. Slow-moving, curious manatees tend to gravitate toward humans, a trait that is often detrimental to the animals. Each year, dozens of manatees are injured and killed by watercraft. Waterways up and down the eastern seaboard are becoming increasingly congested, and coastal human population growth is rampant.

Conservation measures for manatees have increased considerably over the last 20 years. Regulations on coastal development and restrictions on the speed of watercraft in manatee habitat are just two steps that have been taken to protect this endangered marine mammal. And all the while, manatees keep wandering up to North Carolina.

Wildlife enforcement Master Officer Anthony Cox was quite surprised in early October 2002 when he got a call that a manatee was visiting a park in Washington. He drove to the park to check it out; sure enough, a manatee was munching on vegetation where Havens Gardens city park overlooks the Pamlico River, 20 miles upstream from the Intracoastal Waterway. "I thought it was a prank," Cox said of the manatee call, "but I got there, and John Brown, there it was."

Cox monitored the animal for a few minutes to make sure it was OK and then resumed his regular duties. After his shift ended, he brought his children back to the park and watched the 8-foot manatee for another 45 minutes. "It was not afraid at all," Cox said. "You could stand 3 feet from it on the bank."

So the next time you are out in your boat in summer in a coastal river or sound, keep your eyes peeled. You might encounter a Florida manatee taking a summer vacation in coastal Carolina. ⊠

They hide, bluff or try to blend in, but they're worth getting to know. Meet some

Neighborhood Snakes

written and illustrated by Consie Powell / nature activity by Anne M. Runyon

Are you lucky enough to have a snake live in or near your yard? If so, chances are very good that it will be one of North Carolina's many **non-venomous** snakes. Of the 37 kinds of snakes that live in all or part of our state, 31 are nonvenomous. So when you encounter a snake, it is most likely a peaceable friend that you can welcome to your premises.

Minding Their Own Business

Snakes are shy predators that simply want to be left alone to go about their business of hunting, resting and avoiding being preyed upon themselves. To protect themselves, some snakes act aggressively and perform a harmless bluff to discourage a would-be attacker. Many snakes make use of camouflage, so their pattern or color blends into the surrounding habitat. And virtually all snakes are very good at hiding.

Snakes are **ectothermic** reptiles; their bodies must reach a certain temperature before they can move to hunt efficiently and to digest the food they eat. If a night has been cool, a snake will **bask** in the sun to warm up. In warm weather and consistently mild climates, snakes are comfortable and active all the time. When cold weather comes, snakes become inactive or **hibernate**.

Rough green snakes (22-36") are excellent climbers and forage amid vines or shrubs where they blend with their surroundings so well that they are virtually invisible. Favored meals include crickets, grasshoppers, caterpillars and spiders.

Eastern garter snakes (18-42" long) are common, variable-patterned snakes with stripes down the length of the body and rows of black spots between the stripes. Pattern colors may be yellow, green, brown or olive, but the most consistent identifier is two very small white or yellow spots on top of the head. Garter snakes occupy a wide variety of habitats and eat frogs, toads, salamanders, fish, tadpoles and earthworms.

Meal Time

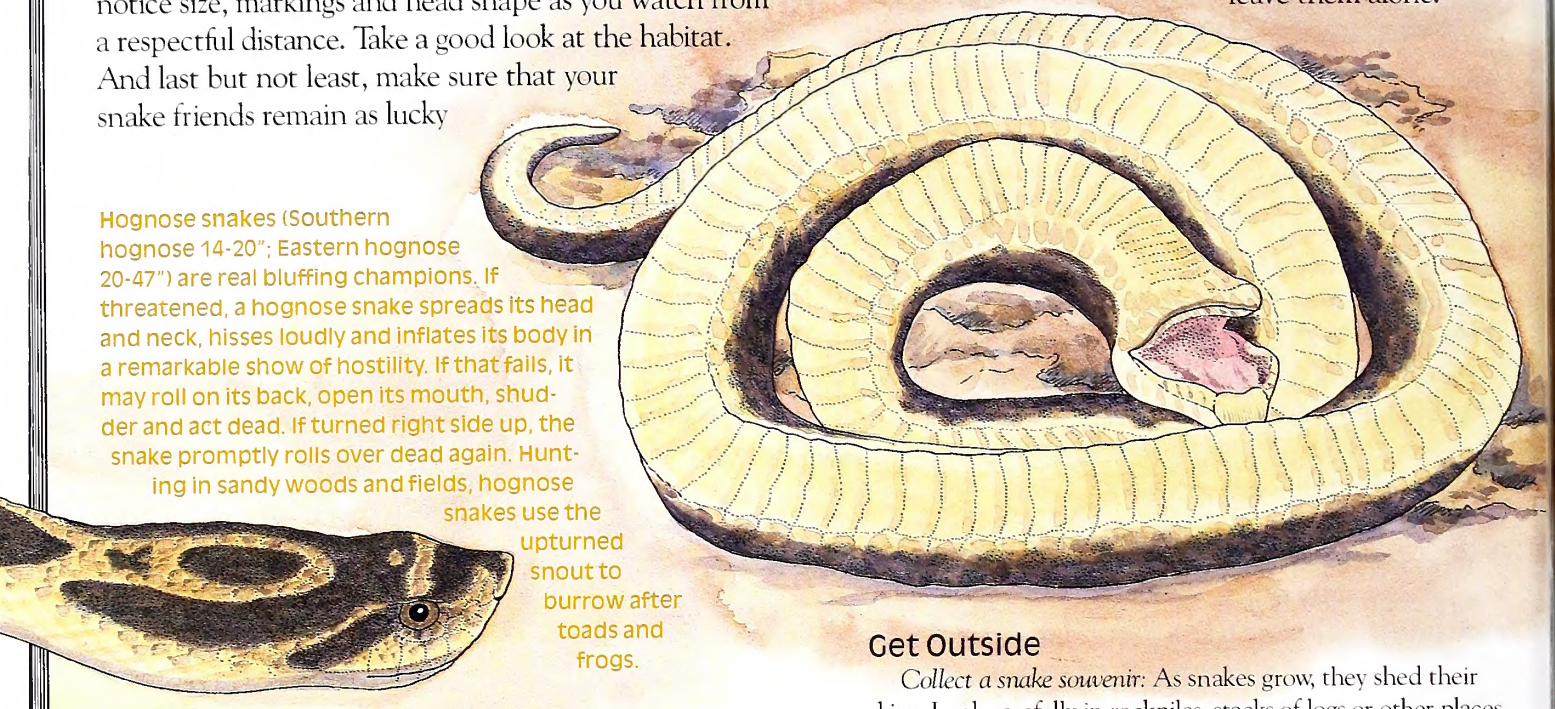
Most snakes feed on small animals such as rats, mice, frogs, toads and insects. When a hunting snake finds a potential meal, it lunges and seizes it in its mouth. In many cases the prey is swallowed alive, but **constricting** snakes squeeze and suffocate their prey before eating it. All snakes swallow their food whole because their small, pointed teeth are not designed for chewing or tearing. A snake's body has some special adaptations that allow it to get a whole prey animal through its mouth and down its throat. Snake skin is flexible and stretches easily. Ribs, attached only to a snake's backbone, can spread wide for the prey's body to pass. But most impressive is the way a snake's jaw and skull bones work. The upper and lower jaws are connected by special hingelike bones. These allow the snake to open its mouth very wide. Each side of the jaw then moves separately. This enables the snake to move the prey farther back and down its throat. Backward-slanting teeth hold the prey and prevent its escape. Abundant saliva **lubricates** the mouth and throat as the meal is swallowed. Finally, a snake can extend its windpipe out the bottom of its mouth so it can continue to breathe during the long, slow process of swallowing large prey.

Black rat snakes (42-85") are among our largest and most abundant snakes. Shiny black as adults, they are strongly patterned with gray blotches when young. Good climbers, they scale trees, cliffs and building walls to capture birds, rats or mice, which they constrict and eat. A black rat snake vibrates its tail rapidly when alarmed and may bite if cornered.

Corn snakes (30-72") are beautifully patterned constricting snakes with bellies of boldly checkered black on white. Found throughout the state, they like pine barrens, woodlots and rocky hillsides. Corn snakes spend a lot of time resting or prowling in burrows or underground passages of the rats and mice on which they prey.

FRIENDS FROM A DISTANCE

If you want a chance to see snakes in the wild, you will need to be quiet and observant. Once you spy a snake, notice size, markings and head shape as you watch from a respectful distance. Take a good look at the habitat. And last but not least, make sure that your snake friends remain as lucky as you have been to see them. Appreciate North Carolina's beautiful nonvenomous snakes as you leave them alone.



Hognose snakes (Southern hognose 14-20"; Eastern hognose 20-47") are real bluffing champions. If threatened, a hognose snake spreads its head and neck, hisses loudly and inflates its body in a remarkable show of hostility. If that fails, it may roll on its back, open its mouth, shudder and act dead. If turned right side up, the snake promptly rolls over dead again. Hunting in sandy woods and fields, hognose snakes use the upturned snout to burrow after toads and frogs.

What Does It Mean?

nonvenomous: animals that do not use poison to capture prey or defend themselves

ectothermic: having a body temperature that is controlled by the temperature of the environment; also called "cold-blooded"

bask: to lie in the sun in order to soak up heat

hibernate: to spend the winter in a state of inactivity in which an animal's body temperature drops, and its heartbeat and respiration slows down

constricting: tightening coils around a prey animal until it dies of suffocation

lubricate: to make smooth and slippery

Read and Find Out

- *A Field Guide to Reptiles and Amphibians of Eastern/Central North America* by Roger Conant, Houghton Mifflin Co., 1998.
- *That Snake in the Grass* by Lilo Hess, Atheneum, 1987.
- *Snakes* by Sylvia A. Johnson, Lerner Publications Co., 1988.
- *Snakes: Their Place in the Sun* by Robert M. McClung, Henry Holt and Co, 1993.

In *Wildlife in North Carolina*:

- "Snakes of the Appalachians" by Harry Ellis, June 1982.
- "A Hatch of Green" by Kerry Givens, July 1986.
- "All Things Cold and Slithery" by Vic Venters, May 1990.

Get Outside

Collect a snake souvenir: As snakes grow, they shed their skins. Look carefully in rockpiles, stacks of logs or other places a snake might be able to find a rough surface to hold the old skin while it works its way out of it. When you find a snakeskin, pick it up gently and you may be able to retrieve it all in one piece. A snakeskin gives you a perfect impression of the entire snake. Can you figure out what kind of snake left the skin behind?

Study a bit first: Before you head out to look for snakes, spend some time snooping through a good field guide to familiarize yourself with the appearance of the many nonvenomous snakes in North Carolina, as well as the six venomous snakes that live in our state. That way, you will have a reasonable idea of what kind of snake it is as soon as you spot it.

Record it for later: If you are quiet and move slowly, you may be able to watch a snake without it moving away from you. Take this opportunity to sketch or photograph it, and to make notes about its size, color and markings. Use your field guide to determine what kind of snake it is.

Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at www.ncwildlife.org and click the link for education/workshops.

It's WILD!

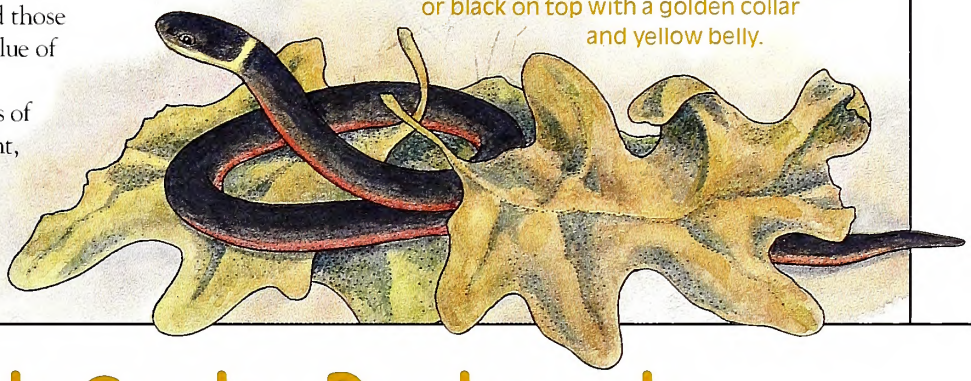
Project WILD activities for teachers and students that correlate to this topic include:

First Impressions teaches students to distinguish between reactions to an animal based on myth or stereotype and those based on accurate information, and to recognize the value of animals' contributions to ecosystems.

Changing Attitudes teaches students to give examples of change in attitude related to animals or the environment, and to describe factors that influence such changes.

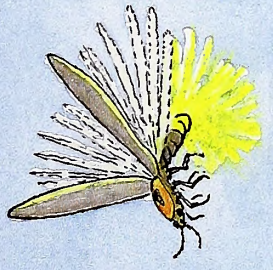
Learning to Look, Looking to See teaches students to describe differences in an environment based on casual and detailed observation.

Ringneck snakes (10-20") are tiny, delicate and secretive snakes that usually hide under boards, flat stones or woody debris by day, and hunt small salamanders, earthworms, small lizards and tiny frogs by night. They are solid dark gray or black on top with a golden collar and yellow belly.



Ringneck Snake Bookmark

Cut out your ringneck snake bookmark along the thick black lines. Fold in half along the ------ line. Glue shut to make your bookmark.



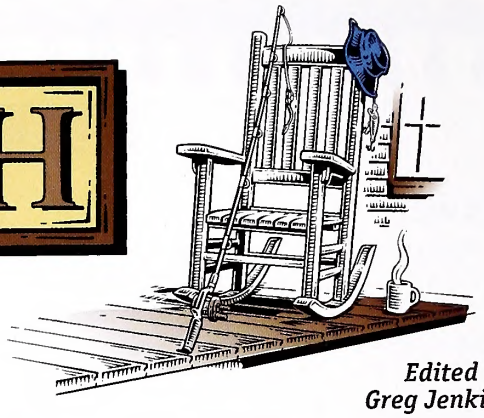
The ringneck snake is a tiny nocturnal hunter of earthworms, small salamanders, frogs, lizards and young snakes.

This reptile thrives in moist, forested habitats throughout most of North Carolina.

The ringneck snake is seldom seen by people because it rests under rocks and logs during the day.

BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

Cardinal

MELISSA McGAW

A Life Simply Lived, a Gift Well Given

Eleanor Robinson Pearsall was a quiet, intensely private woman who likely would have been embarrassed by the attention generated by even a small article like this one. She was also a thoughtful lover of wildlife who cared enough to give a gift that will stand as an example to others who might be inclined to provide for wildlife.

Pearsall, who died in July 2002—one month shy of her 102nd birthday—was independent, intelligent and passionate about books, the arts and her home. A longtime librarian at Rocky Mount High School, she lived alone beside the Tar River on a 5-acre wooded lot she called Chinquapin Slope. Until Hurricane Floyd flooded her home in 1999 and forced her to move, Pearsall was a fierce advocate for the many species of native songbirds that populated her homestead. Nest poachers such as squirrels and snakes sometimes experienced the business end of her .22 rifle.

Although she had to leave her beloved home for an assisted living center after the flood, Pearsall made sure her estate would continue to protect the songbirds she loved. She left a generous gift to the N.C. Wildlife Resources Commission's Nongame and Endangered Wildlife Fund. Federal matching money increased her donation nearly threefold.

Others who love wildlife may take advantage of the same opportunities Eleanor Pearsall did. For information about making a donation to the Wildlife Resources Commission, contact Theresa Castro at (919) 662-4377. You may write to Castro at theresa.castro@ncwildlife.org, or in care of Administrative Services, 1710 Mail Service Center, Raleigh, NC, 27699-1710.

3 Ways to Support Wildlife Commission Work

1. Nongame and Endangered Wildlife Fund: Money goes to benefit more than 1,000 species of mammals, reptiles, birds, amphibians, mollusks and crustaceans. There are three ways to donate: Mark the check-off box on your North Carolina tax return, purchase a special Nongame and Endangered license plate, or give an outright gift of a check or distribution from a will.
2. Wildlife Endowment Fund: Endowment interest funds special projects and unbudgeted expenses. Donations may be made by outright gift.
3. Wildlife General Operations Fund: Money goes into the commission's regular budget to pay for salaries, wildlife and fisheries management and other operating expenses. Donations may be made by outright gift.

did YOU know?

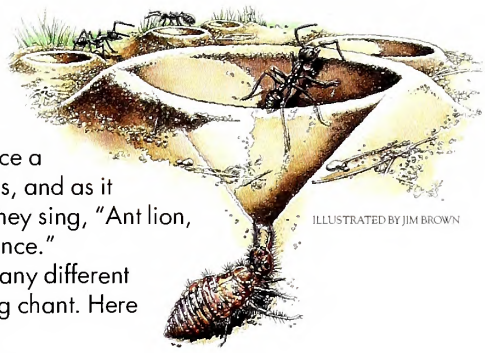
Your faithful Labrador can do more than just retrieve waterfowl and play with the kids—Rover can help keep you safe from tick-borne diseases. "In many instances, the dog will develop the disease before a person in that household will become ill," said Ed Breitschwerdt, professor of medicine and infectious diseases at North Carolina State University's College of Veterinary Medicine.

Lyme disease, ehrlichiosis and bartonella are some diseases known or suspected to be transmitted by ticks. To keep the tiny bloodsuckers off your dog, treat him or her with any of the commercially available topical treatments that kill and repel ticks. There are more than 850 different species of ticks, and they transmit a greater variety of infectious agents than any other type of arthropod. "When I lecture to veterinarians," Breitschwerdt said, "I tell them that what they have traditionally done to help owners keep ticks off their animals is more important now than it ever has been in the history of medicine."

German Shorthaired Pointer

KEN TAYLOR

They're Doodling All Over the World


ILLUSTRATED BY JIM BROWN

We got a passel of comments about David S. Lee's "Doodlebug Days" story in the June issue of *Wildlife in North Carolina* (see below). Most of the commentators reminisced of childhood days spent sitting on the sandy ground and chanting for the doodlebug to come out of his hole while poking the ant lion's trap with a twig or blade of grass.

A bit of research led to a Web site called The Antlion Pit (www.antlionpit.com/folklore.html), which described exactly the same behavior our North Carolina readers told us about—occurring all over the world.

Ant lion chants are astonishingly similar worldwide, involving either the threat of trouble or the promise of food. In Antigua and Barbuda, an island country in the West Indies, an ant lion is called by the Caribbean colloquialism "jam-pee-pee." Children tempt the ant lion with the promise of a good meal of cornbread and seafood, saying, "Jam-pee-pee! Jam-pee-pee! Mammy call you for funjee and saltfish."

In South Africa, "joerie" is the ant lion's colloquial name. Kids chant "Joerie, joerie, botter en brood, as ek jou kry, slaat ek jou dood," which means, "Joerie, Joerie, bread and butter; if I get you, I will kill you."

Sri Lankan children place a "bingundha" in their hands, and as it moves round and round, they sing, "Ant lion, if you dance, I will also dance."

In the U.S., there are many different examples of the doodlebug chant. Here are a few:

Doodlebug, doodlebug,
Come out of your hole.
Your house is on fire,
And your children will burn.

Doodlebug, doodlebug,
Come out of your hole.
If you don't
I'll beat you black as a mole.

Doodle, doodle, come and get some bread and butter.
Doodle, doodle, come and get a barrel of sugar.
Doodlebug, doodlebug, come up and get a grain of corn.
Your house is burning up.

On Patrol

ILLUSTRATION BY JACKIE PITTMAN

After hearing rumors of an illegal deer kill in Polk County, Master Officer Toby Jenkins visited local taxidermy shops and located a deer that was being mounted for the person who had been the subject of the rumors. Jenkins interviewed the subject, who told him he had killed the deer with a bow during the open season. The officer informed the subject that advances in lab technology could detect the presence of gunshot residue on an animal, indicating whether the deer had been taken with a firearm. Fooled by Jenkins' bluff, the subject confessed to killing the deer with a gun.

To the editor,

In his article on doodlebugs, David S. Lee should have noted that generations of North Carolina youngsters have tickled the doodlebug trap holes with blades of grass while uttering the incantation, "Doodlebug, doodlebug, please come home. Your house is on fire and your wife is all alone."

Saying this makes the doodlebug appear faster.

—Joe McDonald
Hoffman, N.C.

To the editor,

I feel compelled to comment on the feature in the June issue by David S. Lee, "Doodlebug Days." One reason I enjoyed it so much was because of the memories it brought back, and I wonder how many others in the state had the same experiences as a lad. I began life on a tobacco farm during the Great Depression, when amusement was where one could find it free.

During those years, most country lawns were swept instead of being mowed. There, and under tobacco barn shelters, the dry soil was perfect for doodlebug fishing. A plantain stem was a good probe; he would bite it and I could pull him out of his hole. A cousin would blow into the hole and call, "Come out, doodlebug, come out."

After a while, the doodlebug would come out of the hole. We did not realize then that the doodlebug was actually checking to see what had disturbed his mound.

I can't help but wonder if today's children could ever amuse themselves with the simple things we had. Keep up the good work. *Wildlife in North Carolina* gets better with each year.

—David Mann
Boonville, N.C.

To the editor,

I enjoy the magazine and I read the "Did You Know?" in the June issue. I wish the differences between cottonmouths and water snakes would have said: "Cottonmouths are a coastal plain snake and are not found in the upper Piedmont or mountains."

This is the most important distinction for anyone in the western part of the state. Many people call all water snakes "water moccasins," consider them poisonous and unnecessarily kill them. Perhaps a future issue could show a range map of the cottonmouth.

—Jack Horan
via e-mail

Storm Debris

KEN TAYLOR

***Hurricanes frequently** leave a legacy of waady wreckage that can be canverted inta habitat far small wildlife.*

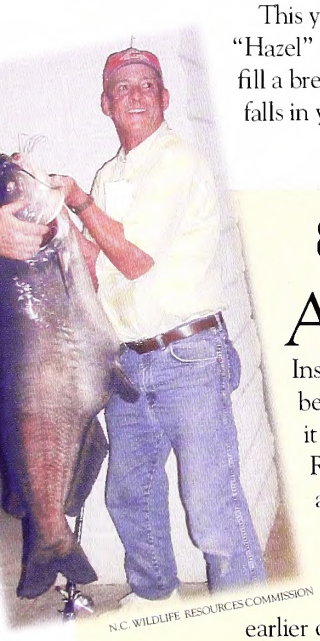
September always seems to be the month that North Carolina finds itself in the crosshairs of hurricanes. These meteorological pains in the neck like nothing more than to arrive unannounced, trash the place, then scram.

They are nature's version of urban, suburban and rural renewal programs. Even a near-miss can cause significant damage hundreds of miles inland, with pines broken in half, oaks uprooted and limbs strewn everywhere.

This year, if an unwanted visitor with a name like "Hazel" blows into your town, give your local landfill a break and keep the copious amount of limbs that falls in your backyard. Besides, your landfill probably is still overflowing with debris from last winter's ice storms.

The sticks and limbs should be piled up near some type of edge habitat, if you have any in your yard. What might look like an eyesore to your neighbors will be paradise to your local wildlife population. These piles of woody debris are to terrestrial wildlife what artificial reefs are to aquatic species. Within a few days, birds, rabbits, invertebrates and who knows what else will be drawn to your storm debris.

—Chris Powell



N.C. WILDLIFE RESOURCES COMMISSION

83-Pound Blue Catfish Sets New State Record

Andy Richmond probably should have been tired. Instead he was ecstatic. He had been up before dawn, and now it was creeping up on 11 p.m. Richmond had been driving around Concord for several hours, looking for a place with certified scales to weigh the massive blue catfish he caught earlier on May 1. Who would have thought that the toughest part of getting credit for catching a state-record fish wasn't finding the beast, getting it to bite or bringing it into the boat? The toughest part was finding a place to weigh it.

Richmond was fishing alone on Badin Lake near Garr Creek when he caught the record 83-pound cat, plus two others that weighed right at 40 pounds apiece and another just shy of 19 pounds. He left the lake around 5:30 p.m. and began to look for a place with certified scales. Richmond stopped at a sporting goods store, two grocery stores and Bass Pro Shops at Concord Mills mall before someone got the idea to try the propane scales at Hickory Grove True Value Hardware.

As Richmond searched location after location, word about his catch spread rapidly via cell phone. Randy Thomas, a hunter education specialist with the N.C. Wildlife Resources Commission, had joined the group by the time the fish made it to the hardware store, and Thomas assisted Richmond in weighing and measuring his big blue. The fish checked in at 49 inches in length and 37 inches in girth. Fisheries biologist Lawrence Dorsey verified the catch and species the following day.

"I've never had a fishing experience like that in my life and certainly never had anything like that on the end of the rod, at least not in fresh water," Richmond said. "I knew I had a real monster catfish but didn't know it was a state record until it was officially weighed. I just went completely bananas."

The previous North Carolina state record blue catfish was an 80-pounder caught in the Cape Fear River on March 21, 1999, by Keith Davis. Richmond caught his fish on 14-pound test line using live gizzard shad as bait. "There's a lot of big catfish out there in Badin," Richmond said. "It wouldn't surprise me one bit if someone didn't catch a bigger one over the next two years."

To qualify for a state record, anglers must have caught their fish on a hook and line, have their fish weighed on a certified scale witnessed by one observer, have the fish positively identified by a qualified expert from the commission and submit an application with a full, side-view photo of the fish.

Benson Angler Catches Record Pumpkinseed

ILLUSTRATION BY DUANE RAVER

Pumpkinseed

Benson fisherman James C. Wood earned a new state freshwater fishing record by reeling in an 8-ounce pumpkinseed sunfish from Parker's Pond on May 9. The record fish, measuring 8 3/8 inches in length and 8 1/8 inches in girth, was caught using a red wiggler as bait. Wayne Jones, fisheries biologist with the N.C. Wildlife Resources Commission, verified the fish as a pumpkinseed. Closely related to other sunfish such as bluegill and redbreast, the pumpkinseed is found mostly in warm, calm lakes, ponds and pools of creeks and small rivers that have abundant vegetation.

Calendar of Events

SATURDAY, SEPT. 6

■ Games, papermaking and other fun activities highlight Terrific Tree Day at the Cradle of Forestry near Brevard. Call (800) 660-0671 or visit www.cradleofforestry.com.

■ Tour 85 acres of land overlooking Cross Creek and the Cape Fear River during a free day at the Cape Fear Botanical Garden in Fayetteville. Call (910) 486-0221 or visit www.capefearbg.com.

■ Check out old boats of all types while enjoying food and music at the Antique and Classic Boat Show in Mooresville. Call (704) 663-2628 or visit www.queenslanding.com.

SATURDAY, SEPT. 20

Watch the annual Moth Boat Regatta, learn about nautical and maritime heritage and see displays of area wildlife at A Day on the River in Elizabeth City. Call the Museum of the Albemarle at (252) 335-1453.

SATURDAY–SUNDAY, SEPT. 20–21

See live snakes on display, and enjoy face painting, crafts and more during Snaketacular at the Natural Science Center in Greensboro. Visit www.naturalsciencecenter.org or call (336) 288-3769.

WEDNESDAY, SEPT. 24

Watch for hawks during a guided bird walk at Chimney Rock State Park. Visit www.chimneyrockpark.com, e-mail visit@chimneyrockpark.com or call (800) 277-9611.

FRIDAY–SUNDAY, SEPT. 26–28

Enjoy crafts and food and learn about the state's fishing industry during the North Carolina Spot Festival in Hampstead. Call (888) 576-4756 or visit www.visitpender.com.

SATURDAY, SEPT. 27

Join a sunset hike to one of the overlooks at Lake James in Nebo. Call (828) 652-5047 or visit www.ncsparks.net.

Reoders should check with the contoct listed before troveling to on event. Items for listing should be conservotion-oriented ond should be submitted ot leost four months in odvance to greg.jenkins@ncwildlife.org, or coll (919) 733-7123, Ext. 264.

Observing Ospreys on High

KEN BLEVINS / WILMINGTON STAR-NEWS

When Jim Teachey saw the big tree come dawn in early 2001, he wanted ta do something. Right next to his house in Wilmingtan, canstructian claimed a tree that had been used by aspreys for nesting, and Teachey really liked watching the birds fly in and out. Taking matters into his own hands, he climbed 80 feet up inta a pine tree in his backyard ta build a nesting platfarm he hoped the ospreys wauld use.

Na saaner had he climbed dawn from the tree than an asprey began ta build a nest. Teachey watched from the graund as the hen praduced ane chick that eventually matured and flew away. Enthralled, he decided he wauld like ta watch the nesting pracess claser—a lat claser.

Teachey shinnied up the tree again and installed a video camera that could be cannected ta his hame camputer. He set up an Internet site and fed the videa image live anta the site, making his project a full-fledged Web cam.

In April 2002, Teachey spatted a couple of eggs in the nest. But to his chagrin, a great harned awl had squatted an the site and beaten the aspreys ta the praverbial punch. He called an area wildlife bialagist ta find aut haw he might remave the awl fram the nest, but he was informed that he best nat tauch the federally protected species.

So Teachey watched with increasing fascinatian as twa dawny awl chicks were barn, ane died, and the survivor grew up and taak flight fram the nest. But he wasn't alane: As ward spread af his Web page, the site gat thausands af hits from owl fans. Peaple e-mailed him fram all over the warld, expressing their delight at the up-clase laak Teachey's Web cam provided. Teachers viewed the site with their classes, and peaple unable to get autside thanked him for the appartunity.

"The mast touching thing to me abaut the awl situation was when a waman wha was bedridden e-mailed me," Teachey said. "She tald me how much it meant ta her ta be able to watch wildlife, because she never had been able ta befare. When I printed out that e-mail and showed it ta my secretary, she cried."

This spring, the ospreys beat the awls ta the nest, and three eggs hatched in May. The Web site crashed accasianally because af the high amount af traffic as the three chicks dwindled ta ane fledgling who took flight in late June. At last check, the nest was empty, but Teachey is planning to readjust the camera far an even better view before nesting season begins in the spring af 2004.

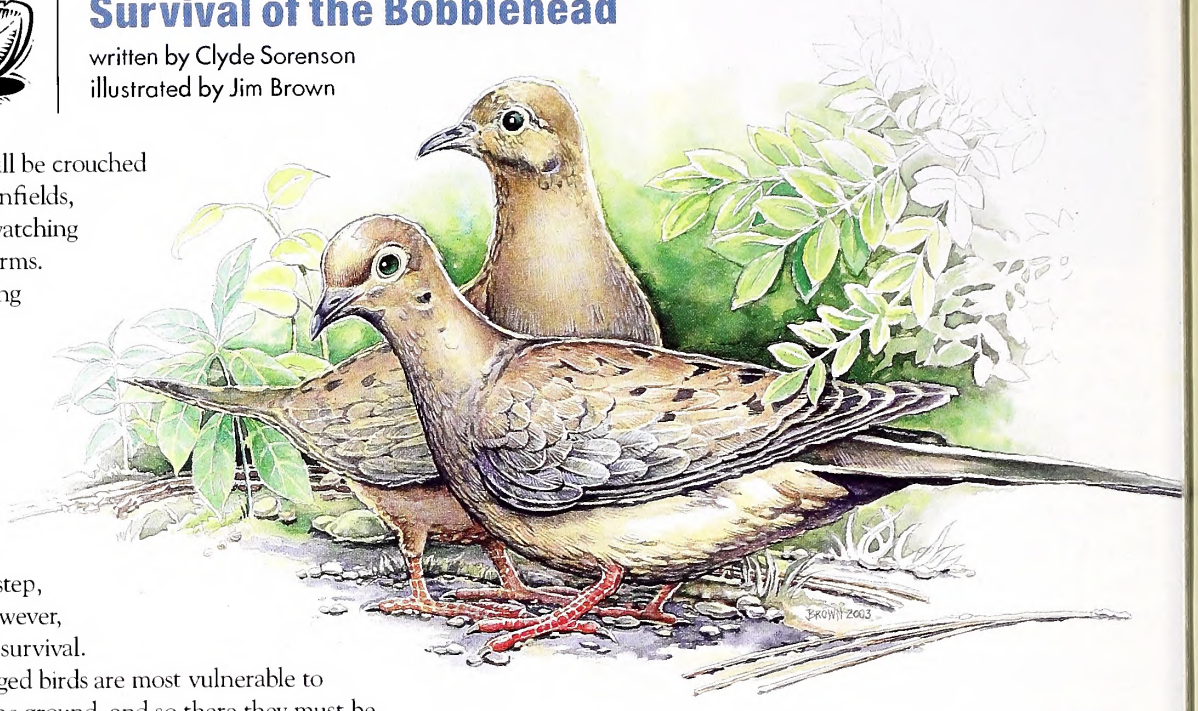
If yau are interested in the fascinating spectacle af ospreys (ar anather type af caastal bird) nesting, baakmark http://home.ec.rr.com/ospreynest. Be sure ta check back in the spring to see what the newest resident af Teachey's nest will be.

—Greg Jenkins

Nature's Ways

Survival of the Bobblehead

written by Clyde Sorenson
illustrated by Jim Brown



This month, many of us will be crouched in the margins of cut cornfields, shotguns in hand, anxiously watching the skies for hurtling brown forms. Mourning doves are challenging game birds because, like most pigeons, in the air they are among the most agile and powerful of birds. But on the ground, doves look a little—well, silly—especially when they walk. Their short legs give them a rather Chaplin-esque waddle, and with each step, their heads comically bob. However, their amusing gait is all about survival.

Doves and other short-legged birds are most vulnerable to predation when they are on the ground, and so there they must be particularly vigilant. Eyes see best when the head is motionless. The bobbing of a dove's head as it walks maximizes the time that the head is still. It holds its head motionless as it takes each step forward, then rapidly snaps its head forward at the conclusion of the step. Other birds accomplish the same goal in different ways. Robins intersperse quick hops with longer periods of careful watchfulness; long-legged, open-ground-loving killdeer run rapidly from motionless observation post to motionless observation post. And speedy quail simply rely on running from patch of cover to patch of cover to elude predators.

Rowe Honored for Commitment to Hunter Education

David Rowe loves to mix business with pleasure. Rowe, a wildlife biologist for the N.C. Wildlife Resources Commission, spends much of his free time volunteering as a hunter education instructor and shooting-team coach in Chowan County. For his devotion to teaching others, Rowe was named 2002 Hunter Education Volunteer of the Year by the N.C. Wildlife Federation.

David Rowe

JOON POWELL

"David has, for many years, dedicated himself through the investment of many, many hours of his personal time to youth hunter and shooting education," said David Cobb, chief of the commission's Division of Wildlife Management. "He is most deserving of this recognition."

Rowe, who has worked for the commission for more than 27 years, helps with most of the hunter education classes in the county. He especially enjoys teaching the wildlife management and archery sections of the course. Rowe has spent a tremendous amount of time with youth, helping guide the hunter safety shooting teams at Chowan Middle School and John Holmes High School since 1991.

"Working with kids, you realize that there are a lot of good youth out there," Rowe said. "You don't get into this kind of thing for the awards. You do it out of interest and kindness."

Rowe sits on the National Rifle Association's (NRA) state grant committee and helps review grant applications to determine which ones advance hunter education the most. He is also active with the Friends of the NRA, an organization that fosters youth hunter education. Rowe consistently stresses that outdoor activities are for families, and that teaching others how to enjoy the outdoors safely and responsibly is the best way to promote, protect and enjoy hunting heritage. An expert archer, Rowe also finds time to hunt and to make a couple of custom longbows each year.

Catch Us at these Numbers

1-800-662-7137 to report violotions of hunting and fishing lows

1-800-628-3773 (NC VESSEL) for boat registration and titling

1-800-675-0263 for hunting dates ond shooting hours for migratory gome birds

1-888-248-6834 (2HUNTFISH) to purchose most licenses with VISA or MasterCard using a touch-tone telephone

1-800-446-8663 (I GOT ONE) to report big game harvests

Connect to the commission's online Web site ot **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Wildlife Endowment Fund Report

Fund Balance $53,946,647.28

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

N.C. WILD STORE

CONTINUE *the* TRADITION

2003
North Carolina Migratory Waterfowl Print and Stamp Set

Cypresses stand like sentinels along a blackwater bay. A splash breaks the morning stillness, and a Boykin spaniel retrieves the kill. Wilhelm Goebel's "Traditions at Suggs Mill Pond" portrays the artist and his daughter duck hunting on Suggs Mill Pond Game Land. When you buy North Carolina's 21st waterfowl print and stamp, you contribute to wetlands conservation and commemorate our hunting heritage. Overall print size: 12" x 14"; image size 6 ½" x 9". The set includes a free museum-edition print of Ron Louque's "Canvasbacks at Whalehead." *(See the description below for additional information.)*

No shipping-handling fee or discount applies.

2003 Print and Stamp Set
$145 ITEM CODE **DSP03**

2003 Mint Stamp Only
$10 ITEM CODE **DSPS03**

Free *with purchase of 2003 print & stamp set*

"Canvasbacks at Whalehead"

This limited-edition museum print of a Ron Louque painting depicts canvasbacks in flight above the historic Whalehead Club in Currituck County. It is a gift when you purchase the 2003 state or federal print and stamp set, and it is also sold separately. Overall print size: 19" x 24"; image size 13" x 18". *No shipping-handling fee or discount applies.*

$50 ITEM CODE **FA1**

The 2003-2004 federal duck stamp print featuring Ron Louque's winning entry is also available. (See page 40 for details.)

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

▲ Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.

$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

▲ Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

▲ **Largemouth Bass.** This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12LRG** (large)
A12XXL (extra extra large)
Extra large size is no longer available.

left front design

▲ **Snow Geese.** Celebrate waterfowl conservation with this white, all-cotton tee. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this all-cotton tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**

These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail and tree. Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶

Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams. Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

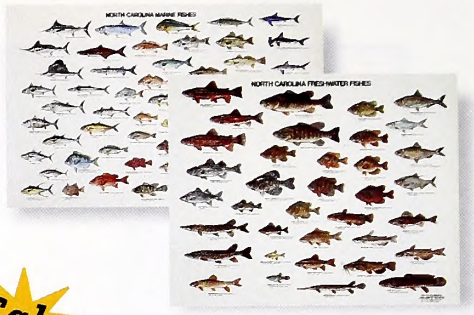
more items available online at www.ncwildlife.org.

▲ Rivers of North Carolina

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* (Nov. 1999) chronicles the natural history of 17 major river basins.

Half-price while supplies last.

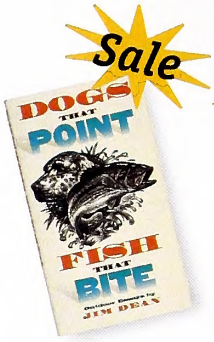
$5 ITEM CODE **M11**



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**



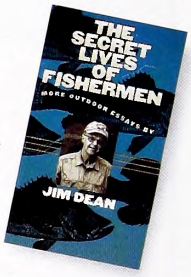
◀ Dogs that Point, Fish that Bite

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

Hardbound ~~$19.95~~ $14.95
ITEM CODE **M8**

Paperback ~~$10.95~~ $8.00
ITEM CODE **M12**

Set of both volumes
Hardbound $30.00
ITEM CODE **M14**



The Secret Lives of Fishermen ▶

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound ~~$24.95~~ $18.50
ITEM CODE **M13**

North Carolina WILD Places: A Closer Look ▶

Book and Posters Set.

Explore the diversity of the state's natural communities. This soft-cover book describes 13 habitats across the state with illustrations by Anne Marshall Runyon. A folding pair of habitat posters by Runyon and a WILD Places map by Jackie Pittman make this set a teaching tool.

$16 ITEM CODE **E6**

2003–2004 Federal Duck ▶ Print and Stamp

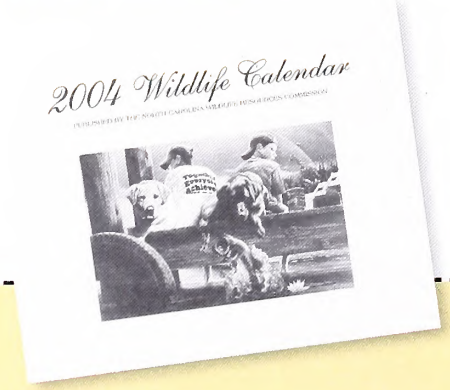
Greater snow geese take wing over the Chincoteague National Wildlife Refuge on the 70th edition of the federal duck stamp. Artist Ron Louque is making signed prints of the stamp available, and we have a limited number. Overall print size: 12" x 14"; image size 6 1/2" x 9". Includes a free museum print of the artist's "Canvasbacks at Whalehead." *(See page 37 for details.)*

A $9.50 shipping and handling fee applies.

This item not subject to 15% discount.

Print $189 ITEM CODE **FDSP03**
Stamp $16 ITEM CODE **FDSS03**

2004 North Carolina ▼ Wildlife Calendar



A Great Gift!

Place your order now. Complete and mail to CALENDAR, N.C. Wildlife Resources Commission, 1710 Mail Service Center, Raleigh, NC 27699-1710. To order by phone, call (919) 662-4377. Order online after September 1 at www.ncwildlife.org, or visit the sales office at 322 Chapanoke Road in Raleigh. (Allow 3 weeks for delivery.)

Complete the form below.

Name _____

Address _____

City/State/Zip _____

Calendar Costs:

1 to 9	$6 each
10 to 25	$5.50 each
26 to 199	$5 each

Please send _____ N.C. Wildlife Calendars at $_____ each. $_____

N.C. residents add 7% sales tax. $_____
(Wholesale orders are exempt from sales tax with a completed Certificate of Resale.)

Total $_____

ALL ORDERS MUST BE PREPAID BY CHECK, MONEY ORDER OR CREDIT CARD.

☐ Check or money order enclosed made payable to **NCWRC**. ($20 charge on returned checks—N.C.G.S. 25-3-512.)

☐ VISA MasterCard # _____ Exp. ____/____

Signature _____ Phone ( ) _____

Feast on

THE 2004 NORTH CAROLINA WILDLIFE CALENDAR

Feast of Flowers BY CATHERINE MCCLUNG

The 2004 N.C. Wildlife Calendar features the work of artists you've enjoyed in the past, including Carl Brenders, Bob Dance, Dempsey Essick, Terry Isaac and Duane Raver. For 2004, we've added three new artists: Al Agnew, Kevin Daniel and Catherine McClung. Order your calendar now to enjoy next year's wildlife notes, "best fishing days" designations and outdoor recreation tips.

Calendars are $6 each with discounts for orders of 10 or more.

- **Order by phone with a MasterCard or VISA by calling (919) 662-4377.**
- **Order online with a MasterCard or VISA by visiting www.ncwildlife.org.**
- **Order by mail using the order form on page 40.**

Coastal Cabaret

A blackwater paddle trip is the surest way to encounter the sights and sounds of a coastal marsh, including the vigorous singing of a long-billed marsh wren. More on paddling adventures on page 12.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

.67/10

WILDLIFE IN NORTH CAROLINA

OCTOBER 2003 $2.50

N.C. DOCUMENTS CLEARINGHOUSE

SEP 30 2003

STATE LIBRARY OF NORTH CAROLINA RALEIGH

False "Applecores"

by Jim Dean

JIM DEAN

"The mania to hook one of these bolts of lightning on a fly has also spread up and down the coast."

I first encountered the fish we call false albacore in the early 1960s while fishing from ocean piers at Emerald Isle. We'd see them in late fall in groups of two or three fish, leaping and slicing swiftly through bait. They would take a small forged spoon, but the trick was guessing where they would appear next and casting ahead of them. Local fishermen thought we were nuts (still do) because the fishes' flesh is bloody and oily. Yet, if you managed to hook up, one of these 5- to 20-pound, football-shaped speedsters would smoke your reel.

One afternoon a lanky fisherman watched us catch a couple. After returning from the pier house with a spoon, he asked us to help him rig it. "I'm gonna catch me one of them applecores," he announced.

They've been applecores to me ever since, though almost everyone calls them Fat Alberts. For what it's worth, they aren't true albacore but are actually spotted bonito, or little tuna. Although they have always been quite common along our coast, they were largely ignored until it was discovered that they could be caught on a fly.

It is probably fair to say that no other fish has had a greater impact on the booming popularity of saltwater fly-fishing in the mid-Atlantic states over the past dozen years. Cape Lookout has become a famous destination for fly fishermen seeking albacore, and during the peak season in October and November, the ocean is often swarming with boats chasing schools around the cape and back west along Shackleford Banks to Beaufort Inlet. The mania to hook one of these bolts of lightning on a fly has also spread up and down the coast.

While the false albacore may be the signature species of this boom, the quest to catch salty species on a fly has a much older history. Author and angler Joe Brooks of Baltimore, and later Richmond, is arguably the father of all this marvelous madness. His 1950 book *Salt Water Fly-fishing* chronicled his years of experience catching salty species on flies (using bamboo rods!) in Florida, Bermuda and the brackish estuaries of Maryland and North Carolina. But Joe was quick to note that a handful of fly fishermen had already been fishing saltwater with flies 75 years earlier. Through the 1950s into the 1970s, Pan Am pilot Stu Apt and other experts advanced the sport in Florida and in other tropical waters, making tarpon and bonefish a "must" target for serious fly fishermen. Lefty Kreh joined this elite bunch when he moved from Maryland to Florida in the 1970s to head up the Miami Metropolitan Fishing Tournament. With amazing fly-casting skills, enthusiasm and innovative talents, he became the fly-fishing guru of the modern era, designing the famous Lefty's Deceiver fly and advancing both tackle and techniques.

But saltwater fly fishermen remained a rarity in North Carolina, though a handful were experimenting with flies. About 1970, I began stalking inlets and rock jetties with a 10-weight Scientific Angler glass rod that must have weighed half a pound. I confess I had no confidence in my primitive flies and often tipped them with squid to catch a few blues, trout and flounder.

One day, my fishing buddy Tom Earnhardt managed to tangle with some giant blues on flies at the rock jetty at Lookout while fishing from a small bass boat. "Absolutely melted a 1498 Pflueger Medalist," he recalls. Albacore soon followed, and the sport slowly gathered converts. They recognized the mid-Atlantic's potential to provide the kind of fly-fishing previously thought to exist only in Florida and other warm waters. Even so, fly-fishing in saltwater anywhere would still almost certainly be an oddity were it not for improvements in tackle over the past dozen years—high-tech rods and reels, superb fly lines and an astonishing array of synthetic fly-tying materials.

Now North Carolina's saltwater fly fishermen enjoy great success catching Spanish mackerel, spotted and gray trout, bluefish, flounder and many other species. A nearly fanatical following has developed for red drum (also called channel bass or redfish), although most fly fishermen concentrate on puppy drum (young red drum of 15 pounds or less). Their particular passion is to try to find and catch these fish schooling on the shallow flats during flood tides. All this activity has spawned local fly shops and guide services that would have been undreamed of 30 years ago.

Gone are the days when we thought, "It's not so much that fly-fishing works so well, but that it works at all." The sport has come of age, the mid-Atlantic is the new mecca, and "them applecores" have had a lot to do with it.

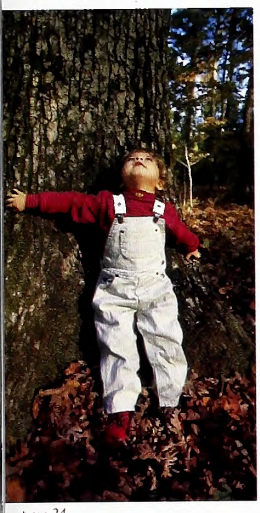
Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

October 2003

Volume 67, Number 10



page 24

page 2

Features

2 **Untamed Corolla** *written by John Manuel*
photographed by A. Mack Sawyer
There's a wild part of the Outer Banks few vacationers get to see.

8 **The Forgotten Game Bird** *written by H. Lea Lawrence*
Rails, also called marsh hens, may be the least-hunted North Carolina game bird.

12 **They Only Come Out at Night**
written and photographed by David Hart
It takes a special breed to be a coon hunter.

18 **Bucks in the Rut** *written and photographed by F. Eugene Hester*
Male white-tailed deer send unmistakable messages during mating season.

24 **Big-Tree Safari** *written by T. Edward Nickens*
photographed by Melissa McGaw
You never know what will nurture a youngster's interest in nature.

page 12

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Julie Dunlap* 28
Back Porch *by Greg Jenkins* 32
N.C. WILD Store 37

Cover *A boat, a dog and a stout pole assist the few hardy rail hunters left in the state. Photo by F. Eugene Hester*

page 28

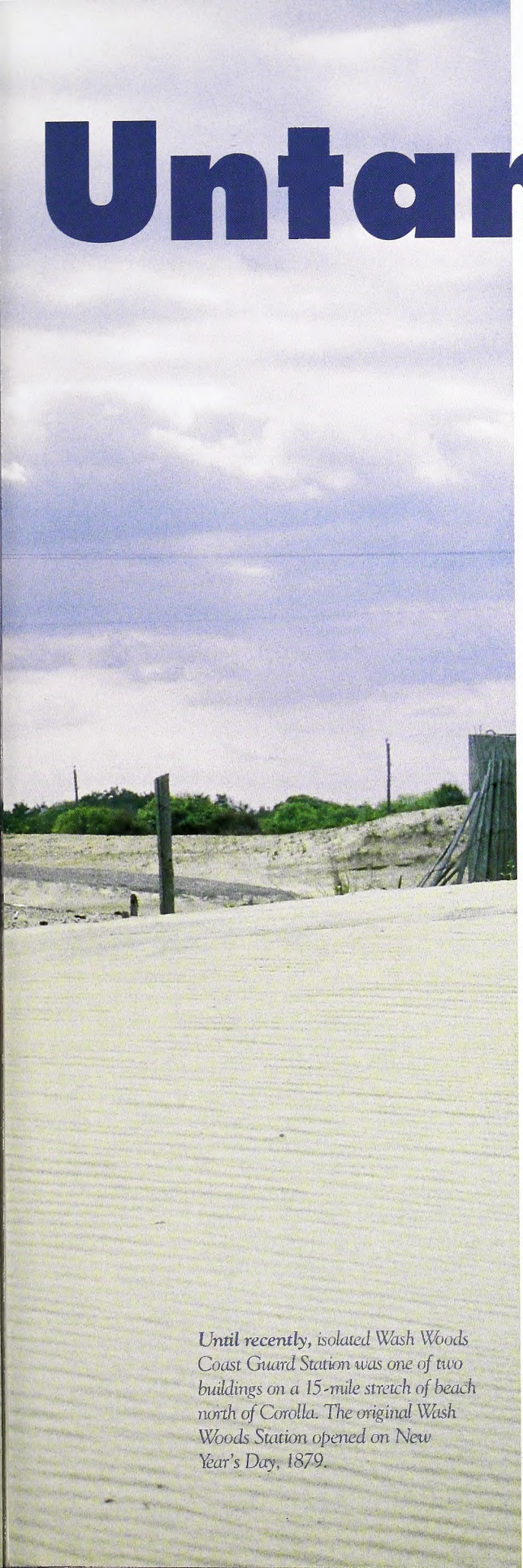
Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $12, three years $30, lifetime $150. All foreign subscriptions are $28 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.

Untamed Corolla

There's a wild part of the Outer Banks few vacationers get to see.

written by John Manuel
photographed by A. Mack Sawyer



Until recently, isolated Wash Woods Coast Guard Station was one of two buildings on a 15-mile stretch of beach north of Corolla. The original Wash Woods Station opened on New Year's Day, 1879.

It is a place where Spanish mustangs graze beside wild pigs and white-tailed deer; where sand dunes swallow forests and spit them out as stumps; where Main Street is traversable only in four-wheel drive. Welcome to the Corolla Outback, North Carolina's version of the Wild West.

Each year, more than a million tourists visit the Outer Banks, converging on such well-known and increasingly crowded spots as Hatteras, Nags Head and Duck. Corolla, the northernmost town on the Banks, has become the mecca of the well-heeled tourist, thick with three-story mansions and posh resorts. But just to the north of town, the highway and the high life come to a screeching halt. Beyond lies an unkempt patchwork of dunes, shrub thickets and maritime forest—the way the Outer Banks looked before the real-estate developers arrived. Until recently, this area was known by few people other than local residents and a handful of fishermen and duck hunters. Now, guide services are offering tours of the outback. It's a journey not to be missed.

getting there There are three principal ways you can explore the Corolla Outback. One is to drive your own vehicle along the beach and seek out the sights for yourself. This is certainly cheaper than using a guide service, but it has some major disadvantages. You need a four-wheel-drive vehicle and experience driving in sand. If you get stuck, you'll have to hire a towing service. That will cost you big bucks, not to mention the wasted time and embarrassment.

A big reason not to drive your own vehicle is that the volume of traffic along the beach is becoming obscene. In peak tourist season, hundreds of SUVs may line the beach, and traffic jams frequently occur by the entrance ramp at the end of N.C. 12. The parade of traffic takes away the beauty and solitude of the beach and, no doubt, harms the sea creatures that burrow in the sand.

A better choice is to join one of several tours offered by guide services in Corolla. All-terrain vehicle (ATV) tours give clients the chance to drive an ATV along the beach, as well as on private land owned by the tour operators. Four-wheel-drive tours take clients on much the same routes and can include additional exploration by kayak.

For sheer fun and exhilaration, it's hard to beat the ATV tours. Tour operators take you onto their own property to zoom around the dunes away from the shoreline, mindful of damaging fragile habitat. But ATVs are loud and may cause wildlife to shy away from the noise. A four-wheel-drive vehicle allows you to get closer to wildlife and protects you from the weather. A kayak trip provides the most exercise and the closest experience of nature. Each tour will take you to the chief attractions along the banks, including the famous wild horses.

***Generations of** wild horses have survived the changing conditions of the upper Outer Banks. Weathered cypress stumps in the surf bear witness to the constant westward movement of sand.*

Tours enter the beach via the ramp at the end of N.C. 12 and proceed north along the Currituck Banks toward Virginia. Signs along the dunes identify the first few miles of land as belonging to the U.S. Fish and Wildlife Service. This tract is one of several that make up the 4,000-acre Currituck National Wildlife Refuge. Refuge lands (excluding the beachfront) are off-limits to all vehicles, including ATVs. There are no trails or facilities in the refuges, and none of the commercial tours enter them. However, the tracts are havens for all manner of wildlife and may be worth exploring on your own, by foot.

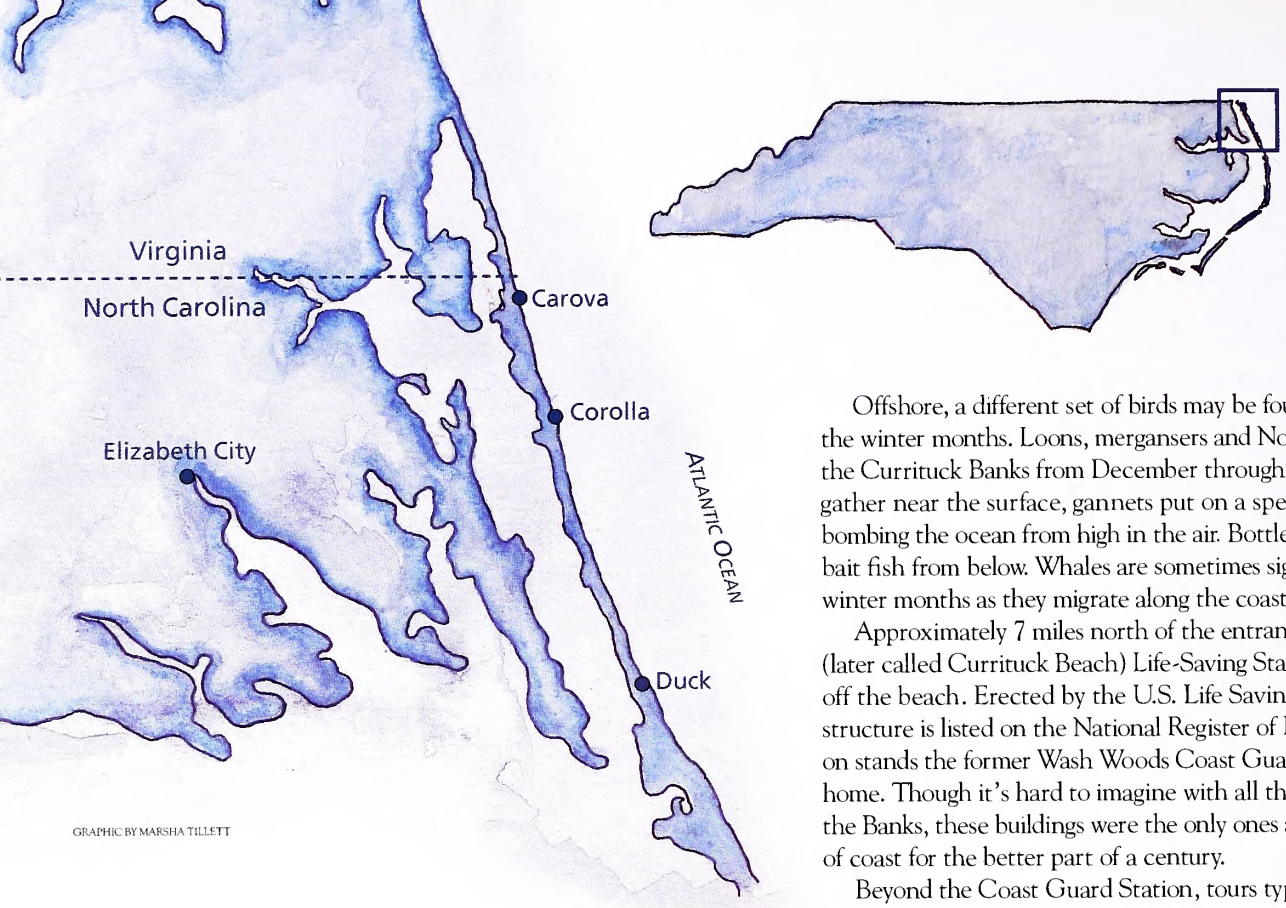
sightings A short distance up the beach, the first of several clusters of tree stumps emerges from the surf at low tide. Here is stark evidence that the Outer Banks are on the move. These stumps are the remnants of cypress trees that once grew on the sound side of the Outer Banks, were buried by the westward movement of sand, and are now reemerging on the ocean side. Several factors, including winds and ocean currents, are forcing the banks westward, but the predominant driver is rising sea level. As the ocean level rises, wave action forces the sand inland. At some point in the foreseeable future, the Currituck Banks may merge with the mainland or simply disappear into Currituck Sound.

Inland of the first stump graveyard looms more evidence that the Outer Banks are on the move. Luark's Hill, often mistakenly referred to as Penny's Hill, is a 50-foot-tall sand dune, second tallest on the Outer Banks behind Jockey's Ridge. Driven by northeasterly winds, the dune is moving southwest across the banks at a distance of roughly 10 feet per year. Its progress can be marked by the detritus left uncovered in its wake. Cans and bottles with 1970s trademarks and slogans such as "7UP—You Like It, It Likes You" emerge like time capsules from the retreating sand. On its front side, the dune is swallowing a maritime forest, the topmost branches of which poke above the dune's crest.

The westward movement of the banks is also taking down man-made structures in the outback. Four miles north of the entrance ramp, several large houses hug the beach, protected from the surf only by a wall of sandbags. The builder of these structures placed a losing bet when he located them close to the water, and now nature is calling his bluff. It's only a matter of time before the houses collapse into the sea, leaving a pile of debris for drivers and pedestrians to negotiate.

A similar fate may befall those houses built on the narrow stretch of banks just north of here. In the early 1800s, the Currituck Banks was cleaved by an inlet (New Currituck Inlet) through which large sailing ships passed. That inlet was filled in by sand around 1820. Houses were built here in the 1990s, but there is no dune system protecting them, and a hurricane or nor'easter could easily send a storm surge over the banks, flooding the houses and possibly reopening the inlet.

While inanimate things succumb to natural forces at work in the outback, animals adjust to changing conditions. Shorebirds gather along the beach, advancing and retreating in time with the waves. These birds tend to collect in groups of as many as half a dozen species. Tiny sanderlings can be seen "piping"—digging in the wet sand for mole crabs and coquinas. Assorted terns and gulls watch the incoming waves for dead and dying fish and crustaceans. One of the advantages of traveling by ATV or four-wheel-drive vehicle is that you can catch up to these isolated groups of birds and, keeping a respectable distance, watch as they go about feeding.



GRAPHIC BY MARSHA TILLETT

Offshore, a different set of birds may be found, especially during the winter months. Loons, mergansers and Northern gannets frequent the Currituck Banks from December through March. When bait fish gather near the surface, gannets put on a spectacular show of dive-bombing the ocean from high in the air. Bottlenose dolphins attack the bait fish from below. Whales are sometimes sighted here during the winter months as they migrate along the coast.

Approximately 7 miles north of the entrance ramp, the Jones Hill (later called Currituck Beach) Life-Saving Station comes into view just off the beach. Erected by the U.S. Life Saving Service in 1903, this structure is listed on the National Register of Historic Places. Further on stands the former Wash Woods Coast Guard Station, now a private home. Though it's hard to imagine with all the houses popping up on the Banks, these buildings were the only ones along this 15-mile stretch of coast for the better part of a century.

Beyond the Coast Guard Station, tours typically head inland along a network of sand roads built by developers in the 1960s. These roads give real meaning to the term "unimproved." After prolonged rains, puddles several feet deep and more than a dozen yards long appear, challenging the best drivers in vehicles with the highest clearance. ATVs have some advantage in that they can skirt the edges of these puddles, but be prepared to get wet.

Inland from the beach, shrub thickets dominate the landscape. Sea oats and American beach grass cling to the seaward side of the dunes; live oaks, cherries and yaupon hollies prevail on the back side. Cloven hoof-prints in the sand bear evidence of the large population of white-tailed deer in the Corolla Outback. Feral-pig footprints—smaller and rounder than a deer's—are common, but the hogs are rarely seen. Red foxes are growing in number and can sometimes be glimpsed during the early-morning tours.

DAVID LEE

***Kayak tours offer** the chance to see abundant wildlife, like this great egret at the edge of a saltmarsh. Tourists on rented ATVs gain access to some private lands, but are prohibited from riding in environmentally sensitive areas.*

As you approach the sound side of the banks, clumps of maritime forests appear on the horizon. These are dominated by live oaks, whose twisted trunks and waxy green leaves form a nearly continuous canopy over a

MELISSA McGAW

A pair of sanderlings *probes the wet sand of the intertidal zone for mole crabs and other small invertebrates.*

relatively open understory. In autumn, migrating land birds, including a variety of flycatchers and warblers, seek refuge in these forests and the surrounding thickets. Maritime forests are also a good place to look for red-tailed hawks, marsh hawks and the occasional peregrine falcon.

Bordering Currituck Sound, the maritime forest opens onto vast expanses of saltmeadow cordgrass dotted with islands of live oak and bayberry. The marsh bears an uncanny resemblance to the African savanna, minus the megafauna. Kingfishers, red-winged blackbirds, feral pigs and raccoons live here.

Houses appear with increasing regularity at the northern reaches of the Currituck Banks. The highest concentration lies in the unincorporated town of Carova (short for Carolina and Virginia), initially developed in the early 1960s. Along with roads, developers put in a gridwork of canals to provide homesites with access to the sound. Surprisingly, these man-made canals have become havens for wildlife.

"We see everything back here—herons, egrets, otters, nutria, cottonmouths, even the occasional alligator," says Andrew Wyatt, a naturalist and guide for Backcountry Outfitters. "With all the trees along the banks, the canals offer more cover than the open marsh." Wyatt takes clients on a one-hour kayak trip through the canals, stopping to examine the flora and fauna along the way. A snake lover, Wyatt has been known to scoop up sunning cottonmouths on his paddle for the appreciation of his clients.

corolla corral A nearby meadow is a favorite haunt of the chief attraction of the outback—the wild horses. Promotional literature often refers to them as Spanish mustangs, and a fair amount of evidence suggests that these animals are indeed descendants of the famed Spanish war horse known as a "barb."

Barbs were small, sturdy horses originally bred on the Barbary Coast of North Africa and adopted by Spanish and Portuguese explorers. The horses' size, toughness and ability to survive on a variety of coarse grasses suited them for European exploration of the New World. Some believe that the horses found on the Outer Banks were left by Spanish explorers in the early 1560s or by English explorers at a later date. Written records dating back to the 1700s mention horses roaming wild on the northern reaches of the Outer Banks. DNA testing conducted by veterinarians at the University of Kentucky confirms a link between the Corolla mustang population and Spanish barbs.

Until the late 1990s, horses were free to roam up and down the banks and were considered a part of the local color. However, they became a hazard to the growing tourist traffic and are now confined to the 15,000 acres north of Corolla by a 4-foot-high, sound-to-sea fence.

Depending upon the setting and one's expectations, seeing these horses can be a thrill or something considerably less. Often, they are found grazing beside the road or in someone's yard, in which case they seem no more exotic than your average pet. Other times, they are seen wading on the beach or fighting in a meadow. In either case, the horses are dangerous and should not be approached closer than 100 feet—that's the law. Stallions can be particularly aggressive. They may preside over a harem of mares and are quite territorial. When threatened, a stallion may display a series of warning gestures: shaking its head, stamping the ground, lowering its head and flattening its ears. If approached too closely, it may charge.

From the Carova area, most tours head back to their starting point in Corolla. If you've gone the ATV route, prepare for a bracing ride over the sand roads. No matter how you've traveled the outback, you may head back to civilization with a swagger, knowing you've seen a corner of the Outer Banks that few people have explored. ⊠

the forgotten game bird

Rails, also called marsh hens, may be the least-hunted North Carolina game bird.

written by H. Lea Lawrence

If you're looking for something unusual to hunt, I can suggest a species that is completely different from anything else you have encountered. How about a bird that would rather run than fly, moves through cover as slyly as a mouse and only infrequently takes to the air? It's a quarry that isn't easy to seek or find, and for that reason, it will attract only the hardiest hunter.

This oddball quarry is the clapper rail, a skinny, long-legged bird that inhabits marshes and is the inspiration for the saying "thin as a rail." These birds stand 12 to 16 inches tall and bear gray, white, cinnamon and brown feathers that provide superior camouflage. Clappers are known as marsh hens because of their chickenlike build and preferred habitat of salt marshes. Clapper rails are only one of four game rail species found in North Carolina marshes. The king rail is slightly larger than the clapper, but it prefers freshwater swamps. The Virginia rail is a smaller version of the clapper, and the sora rail is even smaller. Of the four, the clapper rail is by far the main species hunted in the region. Tiny yellow rails and black rails, also found in the state, are not game birds.

MARSKOWSKI PHOTOGRAPHY

H. LEA LAWRENCE

***The "kek kek" call** of the clapper rail clearly announces its presence. High tide in a shallow marsh is your best chance to catch a glimpse of the secretive bird.*

The tradition of rail hunting goes back to the 1800s, when it was considered a gentleman's sport among the tobacco growers and plantation owners of the Coastal Plain. Guides poled custom-built, shallow-draft skiffs through the marshes while their passengers, gentry in suits and neckties, picked off the clappers. Over the years it has become increasingly difficult to enlist individuals willing to pole hunters through the marsh. Now it's almost always up to the hunters to handle the chore themselves or wade through the marsh on foot. Largely because of this necessity, and because rails can be difficult to find, the birds receive light hunting pressure.

Rail season in North Carolina extends from early September to early November. Visit the N.C. Wildlife Commission's Web site, www.ncwildlife.org, or call 1-800-675-0263 for dates and bag limits.

Many complimentary things can be said about clapper rails, but it's doubtful anyone has ever labeled them graceful. They could easily be classified as ugly ducklings: With short, rounded wings on a skinny body, they fly slowly and awkwardly, with their legs dangling as if they don't know what to do with them.

First-time rail hunters might be inclined to think rails are an easy target. That isn't entirely true. The birds have some tricks that are surprisingly effective, especially around overconfident gunners. Low-flying rails can suddenly drop into the marsh as if they had been hit with a full load of shot. In some cases, the bird hasn't been touched; it's just the way a rail lands. Rails can also take advantage of the wind; their light bodies and broad wings allow them to peel off like fighter planes.

One problem facing rail hunters is that the elements that make for ideal hunting conditions are a bit unpredictable. The best times to hunt clappers are when the highest fall tides occur, flooding rails out of their hiding places in the shallow marshes. An autumn full-moon high tide is the best bet, but sometimes storms can create high tides at other times. Storm tides are predictable only a few hours in advance.

Rising water forces the rails to perch on the stems of marsh grass or on clumps of floating debris rather than run along the ground. They must then either fly or swim when threatened. The higher water also makes it easier to push a boat along and cover more territory. There isn't a way to make poling

Because the use of motors for hunting waterfowl is unlawful, poling and wading are the only ways to get close to clappers.

H. LEA LAWRENCE

F. EUGENE HESTER

Rails provide a challenge *to hunters with their unpredictable flight patterns. A good retriever will help locate a downed bird in dense marsh grass.*

easy, though—it gets to be hard work quickly. And because the use of motors for hunting waterfowl is unlawful, poling and wading are the only ways to get close to clappers.

On flood tides, hunters can expect good conditions for three hours at most. Although there is usually only one high tide per day during daylight hours, sometimes two high tides occur during the legal shooting period. That doesn't mean a double limit, just double opportunity. Even in the best conditions, the daily limit of 15 clappers is hard to claim.

With few exceptions, hunting by boats is the best way to bag rails. My first rail hunt took place many years ago, wading in a marsh behind Wrightsville Beach. This particular spot had a firm bottom, but many marsh bottoms are covered with soft mud that can be 12 inches or 12 feet deep. This makes wading treacherous, to say the least.

Custom-built rail boats of the traditional 19th-century design are practically nonexistent. Today, most gunners use light, flat-bottomed aluminum skiffs, but canoes are suitable in the hands of experienced boaters and are ideal for solo hunting. In either case, hip boots or waders are frequently needed for retrieving the birds.

Most hunters prefer small-gauge shotguns for hunting clapper rails. I've hunted them with everything from .410 gauges to 12 gauges, but the one I favor most is a 28-gauge Ruger over and under, with the improved cylinder/modified choke combination. My favorite load is No. 8 shot. I've also used No. 9 shot and found it effective.

The range of the clapper rail extends along the Atlantic coast, the Gulf of Mexico and portions of the lower California and Mexican coasts. The best rail sites on the East Coast are in New Jersey, North Carolina and South Carolina. North Carolina's top spots are spartina marshes from Cape Lookout to the South Carolina line. The birds tend to concentrate in higher elevations of the marsh. Some places in Pamlico Sound are also productive, allowing hunters plenty of time to watch for high tides.

If you want to experience a unique type of wing shooting, give rails a try. Just make sure that you bring the shotgun, and your partner brings the push pole. ⊠

They Only Come Out at Night

written and photographed by David Hart

It takes a special breed to be a coon hunter.

At 6 p.m. on a cold November night, Darrell Brown and his wife, Rhonda, settle in for a quick meal at the local diner after a full day at work. But while most people are preparing for another evening in front of the television, Darrell's night is just about to begin. It's fall, the trees are bare, and that means it's prime time to chase raccoons.

At 7 p.m., Brown and I rumble down a narrow Stokes County gravel road that curves up a wooded hillside. Brown stops his old truck, opens the dog box and holds his prize dog, Stone, by the collar. Mark Mabe and Johnny Nichols, co-owners of Stone, emerge from another truck. Nichols leads a second hound, Shine, to the edge of the road. Brown and Nichols attach radio collars to the dogs; Stone's is equipped with a bright, glowing red light.

"Ready?" asks Brown. "Turn 'em loose."

Shine and Stone crash through the woods as if they were competing in a race to see who could strike the first whiff of coon. Stone's red light bounces through the ink-black woods and then disappears down the steep hill below us. The four of us stand in cold silence, waiting for the first rolling bawl to echo through the pitch-black forest. For 10 minutes, we hear nothing but the distant howling of house dogs and the lonely whine of tires on pavement. Brown sweeps the air with an aluminum antenna, listening for the blips that tell him where Stone has headed.

"He's over in that direction," he says, pointing with the metal wand. The signal grows louder as he motions toward a distant yard light. Critics of coon hunting argue that the tracking device in Brown's hand has stolen the challenge and the sport from this age-old hunting tradition. Brown and his two hunting companions make a pretty strong case otherwise.

A coon dog *practically runs up a tree in an effort to point out its quarry.*

"All the electronics in the world won't help a dog find more raccoons," Brown says. "I use these transmitters now because I have to. I used to be able to go pretty much wherever I wanted to in the area, but with so many new houses being built and land getting split up into smaller and smaller parcels, I have to keep track of my dogs so I can retrieve them before they get on somebody's property who won't let me hunt. The transmitters only help me keep track of my dogs if they don't strike, and they help me get them back. My dogs are far too valuable to let them run loose all night."

Brown rarely uses Stone for what he calls "pleasure hunting"—going for the sake of hearing the dogs, spending time with friends and simply taking part in the experience. The English redtick has won a roomful of trophies in a variety of competitions. Brown rattles off a list of titles that carry serious weight in the world of coon hunting competitions: United Kennel Club (UKC) Grand Champion, UKC Grand Nite Champion, 11th place in the UKC World Hunt, second overall and first in breed in the Ralston Purina Points Race. Money is awarded only occasionally, so the dogs compete for trophies and ribbons. The owners want nothing more than bragging rights and perhaps a little recognition for their dogs. Brown has plenty of reason to brag: Stone recently graced the cover of a magazine dedicated to coon dogs and coon hunting.

"A champion dog can bring some pretty high stud fees, and the puppies of a real good female can also sell for several hundred dollars," Brown says. "Nobody's going to get rich, but I can make enough money to support my coon hunting habit."

The cost of the equipment alone is enough to convince a nonhunter that Brown is pretty serious about what he does four or five nights a week. The headlamp, spotlight, battery pack and leather harness I wear cost about $500. The radio collar and receiver Brown uses to keep track of his dogs cost him $1,000.

Despite the encroachment of roads, houses and subdivisions across the Carolina countryside, Brown still has plenty of open space in which to turn his dogs loose. He was born and raised less than 5 miles from the brick rambler he now calls home, and he's on a first-name basis with many of the farmers and longtime residents of Stokes County. Before we set out for the night, Nichols uses his cell phone to line up a few farms for the hunt.

"A good dog doesn't make a sound until he's struck scent," Brown says as we wait for the first bark of the night. Shine has already climbed back up the hill, but before she can drop off the other side of the road and onto property we don't have permission to hunt, Mabe grabs the dog and puts her back in the kennel.

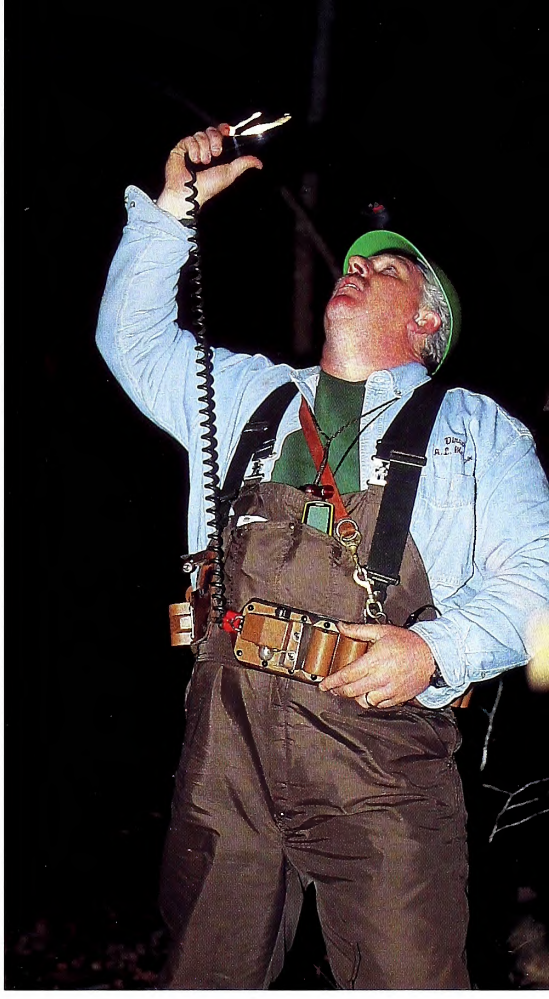
Stone is as good as they come, and when we hear the unmistakable bawl of the big redtick, we know something is about to happen. The slow, deliberate bawling trails off through the ink-black night and then breaks into a steady, rhythmic chop. Treed. When a raccoon is chased up a tree, a typical coon dog will change not only the tempo of its bark but the pitch and depth as well.

We could flick on our headlamps and hoof it down the steep hill and along the creek bottom until we find the dog. But Brown, Nichols and Mabe discuss the quicker option of hopping in the truck and coming around from another road closer to the baying hound. I agree, so we hit the paved road that snakes along the ridge above the creek bottom. The truck turns onto a gravel path that curves down a steep hill, and we park next to a clear stream that splits two steep ridges.

Coon hunters are a loyal fraternity that, aside from jobs, family and a few other obligations, lives for the bawling of a hound rolling through the night woods. Brown used to chase deer and small game, but when I ask him if he misses those other types of hunting, he shakes his head without hesitation. He's hooked. Brown and his wife enter their dogs in competitions throughout the country. They logged 35,000 miles on his truck last year traveling to 15 different states to hunt in competitions or with friends they have met at various events. The contests, he explains, are judged on how fast the dog strikes first scent, how fast it actually trees a raccoon and how well it stays on the tree.

"The judges either have to see the raccoon or they have to see some sort of refuge that the coon can be in," Brown says. "A den hole in the tree or a hole in the ground all count as a treed coon. If there is no raccoon or no refuge, then you lose points. We call that a slick tree or a blank."

***The collapse of** the fur market and decrease in large tracts of land that can be hunted have contributed to a dramatic increase in raccoon numbers. State epidemiologists have attributed past rabies epidemics in part to large raccoon populations.*



F. EUGENE HESTER

***Once a raccoon** is treed, a hunter shines a spotlight in the treetops to locate the animal. Raccoon tracks in the sand or on stream banks are a sure sign that raccoons are on the property.*

Stone and Shine offer a convincing show that something is indeed up the tall poplar we scan with our bright spotlights, but it appears we have drawn a blank. Brown and Mabe blow on squallers, hand-held calls that imitate the chortling sound of a raccoon. They're supposed to make the animal look down, but no eyes reflect the lights that illuminate the top of the tree. The three hunters and I shrug it off, and we shuffle back down the steep hill, dogs in tow, to the warm trucks parked along the creek.

Opposite page, a hunter takes aim at a raccoon treed by his dog. Left, hunters and dogs reunite at the end of a hunt.

Coon Hunter PR

Nobody knows exactly how many coon hunters roam the dark North Carolina woods, but David Gardin, president of the N.C. Coon Hunters Association, says the number appears to be steady or growing slightly, despite the shrinking land base on which to hunt.

"We have 53 clubs with an average of about 35 members [each]. We have a lot of families that are members of clubs, and our association is very active in getting youths involved in coon hunting," Gardin says. "We hold an annual youth-only hunt, and it keeps getting bigger each year. Last year's hunt had 132 entries, and we were able to get about $25,000 worth of prizes donated."

Coon hunters have suffered unduly from image problems, according to Gardin. "We don't allow alcohol at our affiliated club meetings, and we don't allow people to carry firearms in our competitions," Gardin says. "Even pleasure hunters are a pretty responsible group. We have to be. The future of our sport depends on the actions of our members. I think most coon hunters realize that they have to convey a positive image in order to continue having places to hunt, so pretty much all of us are real careful about not leaving trash or tearing up a farmer's field."

Brown and Gardin agree that the number of raccoons in North Carolina seems to be increasing, thanks largely to the decline in trapping and the increase in urban and suburban habitat that raccoons favor. Brown, who lives in Walnut Cove, just north of Winston-Salem, typically has no trouble treeing a raccoon each time he turns his dogs loose. Even coon hunters themselves can be credited for the state's healthy raccoon population.

"We rarely shoot raccoons," Brown says. "I know a guy that will give me $15 for the whole animal. I don't even have to skin it. But if I shot every coon we treed, there wouldn't be any left after a while. I just like to hear the dogs and feel the excitement of the hunt."

Dog Action

Although treeing walkers are by far the most popular type of coon dog, Brown shows strict loyalty to English redticks. Like a NASCAR fan proclaiming undying loyalty to a Ford, a Chevy or Dale Junior, coon hunters never hesitate when asked which breed is best. Both Stone and Shine are redticks, and so are the half-dozen other dogs in the kennel behind Brown's house. Gardin is a hardcore bluetick hunter. One of his buddies swears by black-and-tans.

At midnight, the four of us turn the dogs loose one last time. Shine and Stone show little sign of tiring, but we are beginning to wear down. Two other hunts this evening produced a refuge hole in a small oak tree that leans out over a creek bed and an arrow-straight poplar tree that had nothing but cold air and twinkling stars clinging to its branches. The den tree would have counted in a contest, but the empty poplar would have cost Brown points. Mabe says raccoons will sometimes climb up a tree trunk, leap to the ground and keep moving. Even the best dogs fall for that trick.

This time, the dogs strike almost immediately, and the four of us lean back on the trucks and silently hope for Stone's rolling, two-toned bawl to break into the pleading chop that tells us he's treed another raccoon. It comes within minutes.

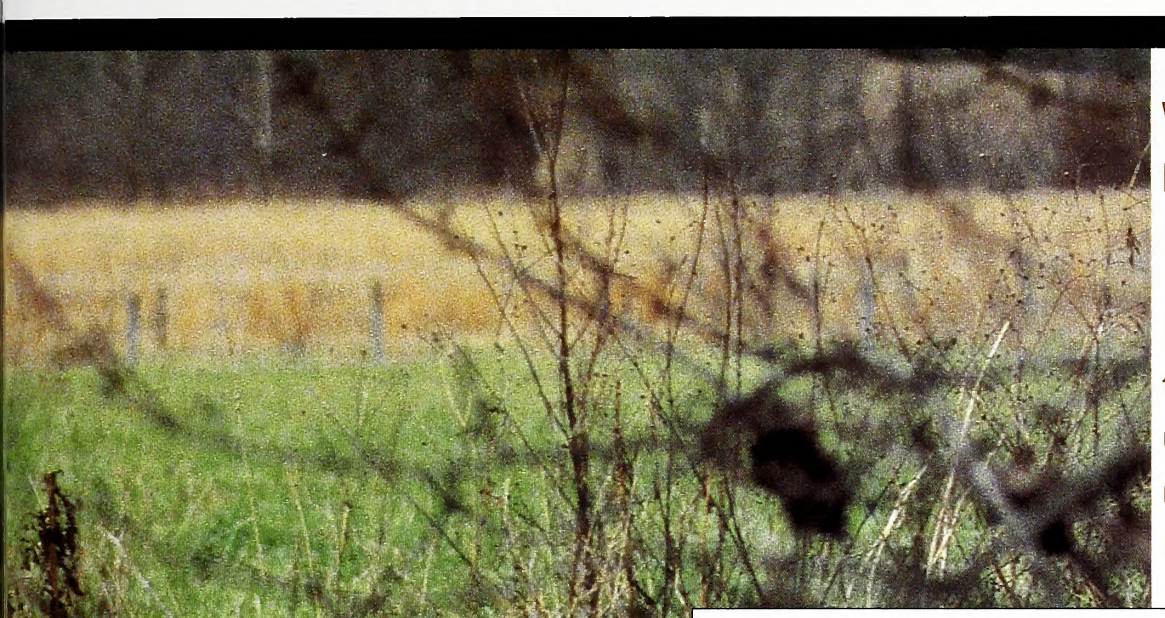
Shine and Stone bounce up and down at the base of a massive pine. If dogs could climb, these two would be up in the crown of the tree, face to face with the coon that we hope is up there. Four of us scan the thick treetop with spotlights as Brown and Mabe blow on squallers.

"There he is," Mabe says. A pair of eyes glow yellow in the spotlights, and the buff gray of raccoon fur is visible through the tangle of limbs. Stone and Shine have performed well, and the four of us are ready for bed. It's been a successful night of coon hunting. We leash the dogs, load them into the trucks and head for home. ⊠

N.C. Coon Hunters Association

Contact David Gardin at (704) 474-5948.

BUCKS IN THE



RUT

Written and photographed by F. Eugene Hester

Male white-tailed deer send unmistakable messages during mating season.

In autumn, a white-tailed buck makes a dramatic transformation from "one of the boys" to lone Casanova. During the summer while his antlers grow, he socializes as part of a bachelor group. But as the days shorten in early September, major changes take place. The testosterone level increases in his blood, his antlers harden and the velvet supplying blood to his antlers dries up. Most of the velvet falls from his rack, and what remains is rubbed off on nearby saplings.

From then on, his attention is focused on the mating season—the rut. A buck depends on his sense of smell, keen eyesight and hearing to detect danger and to locate rival bucks and receptive does. If the buck proves to be dominant, he can breed many does—an example of the strongest and fittest being able to sire the most offspring.

A buck advertises his presence through numerous sensory signals. He applies scents from various parts of his body to the landscape, signaling other deer of his presence and dominance. In addition to saliva and urine, he uses secretions from preorbital glands in front of his eyes, forehead glands at the base of his antlers and tarsal glands on the insides of his hind legs. Though scents may tell a lot about the buck and his readiness for breeding, the ultimate determination of his dominance is fighting prowess. Early in the season, many young and some mature bucks may engage in skirmishes and playful sparring. But when breeding time is imminent, mature bucks challenge each other in serious combat. With antlers pressed together, they push and twist with tremendous force. The contest lasts from a few seconds to several minutes, until one wins and the other runs away. The dominant buck focuses on finding receptive does and will fight other bucks along the way.

Fall breeding produces young the following spring, when greenout has occurred and food sources are abundant. In areas with high doe-to-buck ratios, deer breed into the winter, which delays birth until late summer or even early fall.

RUBBING BUSHES AND TREES

Bucks start rubbing antlers soon after the antlers complete their growth and harden. The initial rubbing removes the velvet covering of dried blood vessels that nourished the antlers during growth. Antler rubbing continues throughout autumn and intensifies as breeding time approaches. As the buck rubs bushes and trees, he leaves scent from his forehead glands. Other deer detect both the physical appearance of the rub and the scent left behind. Additionally, rubbing may function as a mock shoving match with an adversary—somewhat like shadowboxing. Rubbing may strengthen neck muscles to prepare bucks for fights.

MAKING A SCRAPE

A buck advertises his presence by pawing the ground to rake away leaves and grass, leaving a bare spot 2 or 3 feet in diameter. Bucks scrape almost anywhere, including the middle of a field or deep in the woods, but often they scrape along the edge between a grassy field and a wooded area.

TWIG LICKING

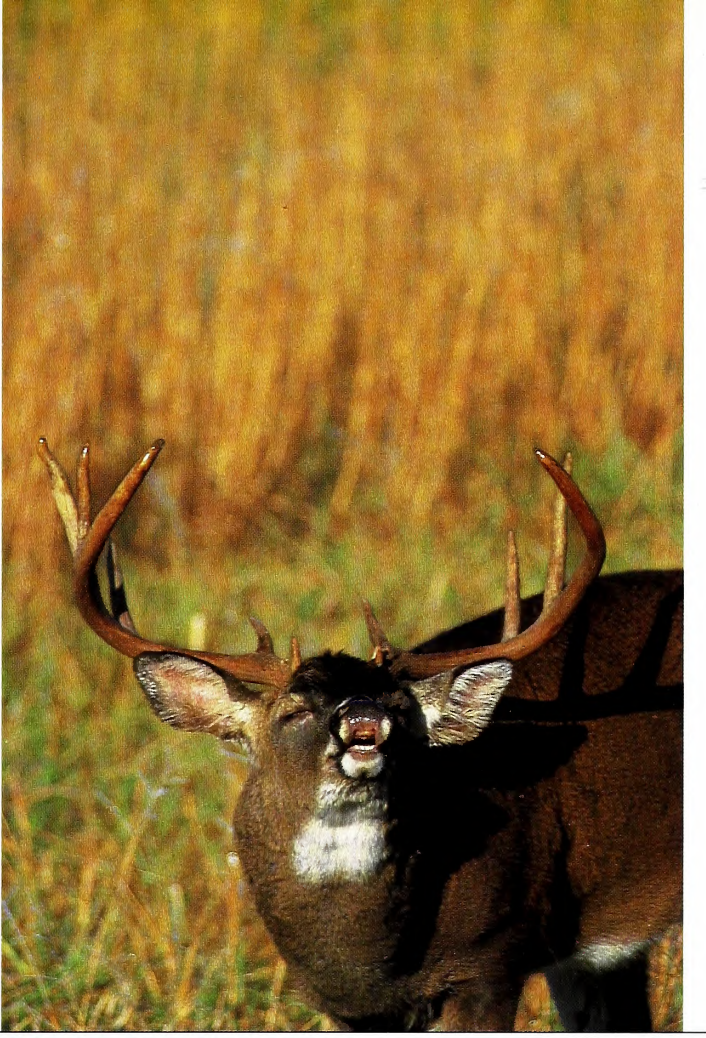
After making a scrape, a buck will often leave his scent in several ways. One is to lick overhead branches. The buck will lick twigs as high as he can reach, sometimes standing on his hind legs. Other bucks will smell and lick the branch. The scrapes and overhanging branches appear to provide a form of social communication between bucks as well as between bucks and does.

SCENTING A SCRAPE △

After making a scrape and licking an overhead branch, a buck often will urinate in the scrape. He may also rub together and urinate on the deeply stained tarsal glands on the insides of his hind legs, adding the pungent scent of the tarsal glands to the scrape.

FIGHTING ▽

During autumn, bucks are continually looking for opportunities to breed. Deer do not form pair bonds. Instead, the larger and stronger bucks breed the most does. Bucks exert their dominance in many ways: by their massive appearance, by staring and by challenging subordinates. At the peak of the breeding season, mature bucks often challenge one another, and dramatic fights ensue. With antlers clashing together, the animals vigorously push, shove and twist. With great speed and strength, they continue until one retreats. These battles occasionally become so fierce that a buck is injured or killed.



SNIFFING FOR SCENT

As a doe approaches estrus (heat), she frequently stops and urinates. Her urine provides a chemical track that a buck can follow. The buck has a special way of drawing the scent into the roof of his mouth, just inside the upper lip. This sniffing action, known as the flehmen behavior, enhances his ability to detect the chemical messages in the doe's urine. The sniffing action causes the grunting sound produced by bucks.

THE CHASE

When the doe nears estrus, the buck pursues her, keeping other bucks away through threatening gestures—grunt-snort-wheeze noises or fights if necessary. When ready to conceive, the doe allows the buck to catch up. After breeding, the buck may stay near her for a day or two and may breed again.

BIG-TREE SAFARI

written by T. Edward Nickens | photographed by Melissa McGaw

I shoulder the pack and cinch the hip belt tight, swig a last mouthful of water, and grab a pair of trekking poles. I'm not one to hang out by the truck for long; I like to get off the road as quickly as possible and let the trees shut out the whine of cars and the glare of sunlight on asphalt. I pick up the faint trail as it cleaves the pines, and duck under a maple sapling. The weight of my load shifts, and I brace for the tiny toe—ugh, there it is—to dig into my back.

"We're in the woods!" squeals Markie, my 2 1/2-year-old daughter. "The very-very-*big* woods."

"That's right, sweetie," I say, craning my neck to glance over my shoulder at brown curls and a wide-mouthed smile. To Markie, very-very-big is second in wonderfulness only to up-in-the-sky-big, and its use indicates that I have a happy baby on my back, and likely a whine-free window of opportunity long enough for a hike to the ridge where I've heard that the big trees grow.

You never know what will nurture a youngster's interest in nature.

"You ready?" I ask.

"I want raisins." Maintaining conversational momentum is not Markie's long suit. I pass the small box over my shoulder and break into the hardwoods, shuffling through shin-high drifts of oak leaves.

I have a simple goal for this hike: I want to find some big trees. Not Big Trees, necessarily. That's the name reserved for those hoary individuals deemed to be the largest of their species found in each state, the greatest of which are listed in *American Forests*'s National Register of Champion Big Trees. Big Trees are scored with an arborist's calculus that combines girth, height and canopy spread in a predetermined formula. But the big trees I'm looking for are measured by the length and duration of the aahs and whistles that accompany their discovery, along with some attendant head-nodding, of course: *Man, that is a HUGE tree!* Nod-nod. *Look at that trunk! You could drive a car right through it.* Throw in a head shake for good measure.

Like all simple pursuits, looking for big trees can become an obsession. I've read of folks who pore over aerial photographs for likely looking individuals, or who parse infrared shots to discern which shades of red belong to which tree species. Nothing wrong with that, nor with having your name in the record books as the discoverer of the nation's champion tulip poplar or devil's walking stick.

But I'm not in the game to share ink with this *Fraxinus* or that *Pinus* in the National Register. I just like the look of big trees. They lend nobility to the landscape, be they deep in the woods or soaring over a farmhouse lawn or city park. To me, big trees don't have to be Big Trees to inspire. Fat-trunked, with sprawling canopies like green thunderheads, they charge no admission, demand no tribute. And that's what I'm after: trees large enough to inspire a bit of wonder, and perhaps to spark in Markie the same kind of primal affection that draws me to woods and forests. "Train up a child in the way he should go," sang Solomon, "and when he is old, he shall not depart from it." Those words take some of the weight off my shoulders as the trail angles sharply downslope.

***A record-size** Southern shagbark hickory tree impresses hikers at the N.C. Botanical Gardens in Chapel Hill, N.C.*

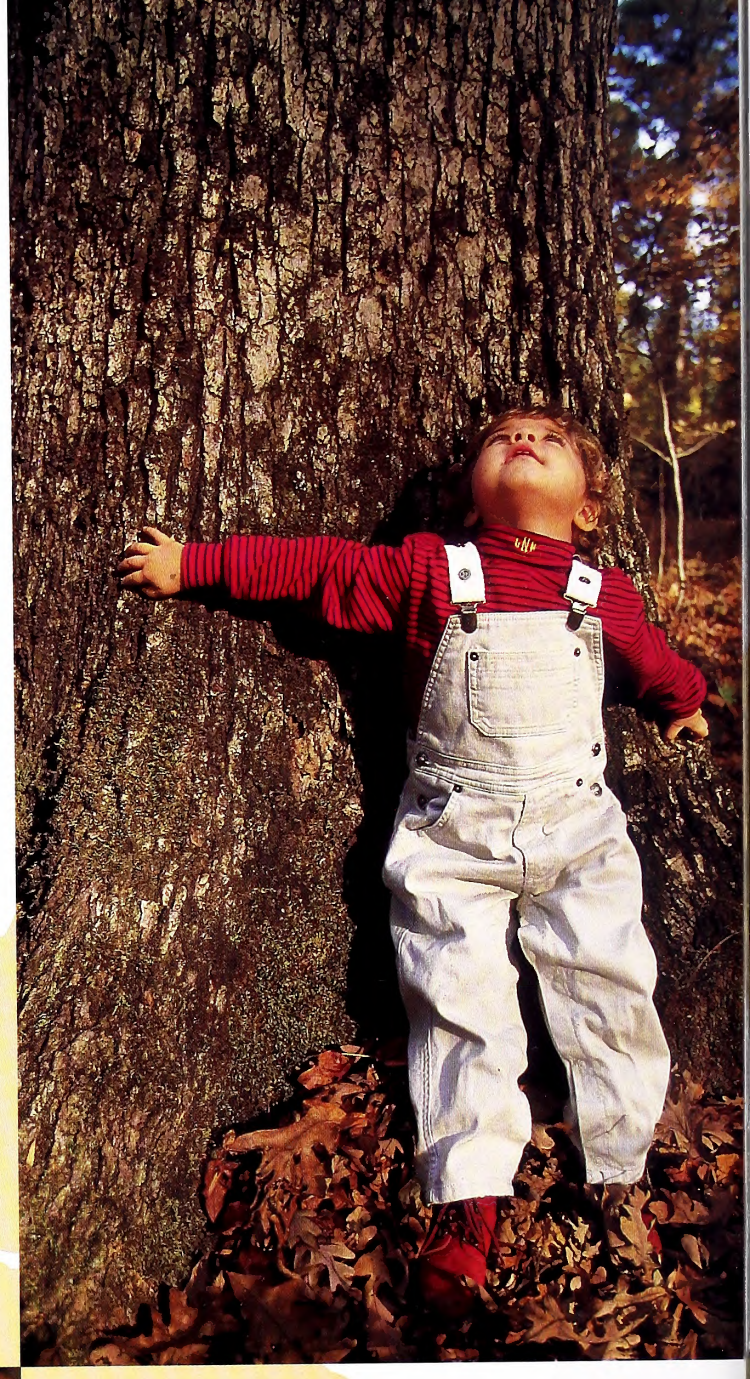
Hiking for big trees?

Stow these items in your daypack:

- First, a good map. USGS topographic maps are the best, especially those drawn on a 1:24,000 scale. On these maps, 1 inch equals 24,000 inches on the ground, or just about $^{2}/_{3}$ of a mile, and that's a scale fine enough for great detail. You'll be able to pinpoint steep slopes, swampy areas where trees might never have been cut, and homesite ruins and cemeteries deep in the woods.
- A small pair of binoculars will help you identify distant leaves and ferns, peer into squirrel nests and check out woodpecker cavities.
- A good regional field guide to trees and shrubs is a plus.
- A tape measure is handy for sizing up trees. To calculate diameter, simply divide the tree's circumference by 3.14.
- And you need a pen, of course, for notes on the map. You don't want to forget where the boo-boo trees are.

Before you take off, hunt for champion tree lists on the Web:

- www.americanforests.org
- www.dfr.state.nc.us



I want her to turn her own face to the sky, to search the massive, storm-twisted limbs for mossy patches where squirrels and raccoons soak up the sun.

These woods, in Wake County's Umstead State Park, are mature second- and third-growth mixed pines and hardwoods—big woods for these parts, but with a history typical of many Piedmont woodlots. They were cut down in the late 18th and 19th centuries, farmed over for 150 years, then abandoned to the natural process of plant succession: broomsedge to pine to hardwood. I skirt past a few trees large enough to fool the unwary. Unschooled in the past lives of eastern hardwoods, many folks see middle-aged oaks—100 years old, 150—and marvel at their size, for they have no idea what a truly big tree looks like. The national champion overcup oak, *Quercus lyrata*, soars 156 feet above the forest floor in Bertie County. That's as tall as a 16-story building.

None of these trees could approach it, but they'll get there one day. As we near a creek, I remember the advice of one famous North Carolina big-tree hunter. "Look in swampy areas," Sid Shearin suggested. "People are scared of swamps, so they stay out of them." Shearin should know; he is superintendent of Pettigrew State Park in coastal Tyrrell County, where a mere 1,200 acres of forest lays claim to seven state champion trees (including the national champion swamp bay and coastal plain willow). At the creek bottom, I glance upstream and down for big trees but instead spy a large pile of white quartzite stones, each the size of a football. A hundred years ago some farmer knew what Shearin knows today: Stream bottoms have rich soil—rich enough for big trees, surely, but rich as well for corn and cotton and tobacco. These slopes were cleared, and stones piled up at the field corners. No big trees here.

We cross the creek and head uphill, Markie content to watch gold and brown leaves rain down with each puff of wind. We're on an unmarked, secondary trail, a mere depression in the forest floor, and with blowdowns from Hurricane Fran occasionally blocking my route, navigation is difficult. I pull out the map. Up on the ridgeline is the cemetery, shown as a simple cross enclosed in a coffin-shaped box. Heading northeast, I pick up a marked trail, sidle along a rocky slope and leave the moist bottomlands behind.

Then I see them. They are homestead oaks, capping the knoll like Golgotha's crosses. They were planted, or protected, to shade a porch or hold up a swing. The farmhouse has long been abandoned, its site a shrubby, vine-choked flat. But the trees remain. They loom like gods, and as I study their gnarly forms—each branch the size of a lesser oak—I understand why the Druids worshiped such trees.

I drop the pack and free Markie from the various restraining buckles and snaps. I want her to turn her own face to the sky, to search the massive, storm-twisted limbs for mossy patches where squirrels and raccoons soak up the sun. I want her to learn to search out the intricate fretwork of the silhouette of a giant oak and to recognize a tree worthy of an elder's respect.

"Look, Daddy, look!" she shrieks, and I think, *By jeeves, I've done it.*

My eyes follow her outstretched finger.

"That tree has a boo-boo."

A who?

"A boo-boo. It's a boo-boo tree!"

A few yards away, someone has tied a strip of white flagging tape around a middling-sized tulip poplar. It looks like a bandage of sorts, I suppose, covering up a wound on a wholly unremarkable individual. A boo-boo tree.

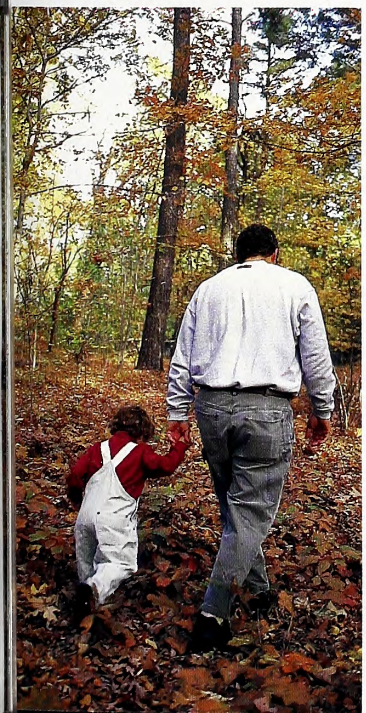
"I want to touch it."

I lift her up to the poplar, and she stretches out a tentative finger, barely brushing the strip of tape as if her touch could send a jolt of pain through the gray trunk.

"Why this tree?" I ask. "Why do you like the boo-boo tree when there are such very-very-big trees all around?"

"I can take care of it," she says, without thinking.

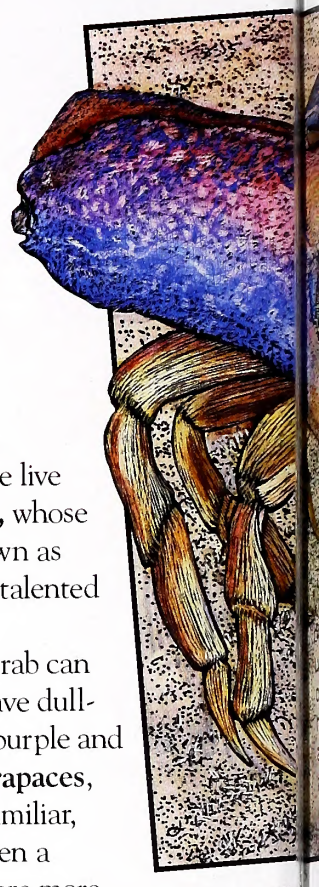
Seems like she's been listening all along.



We're running out of sunlight and raisins—which would be the greater tragedy I couldn't say—so we launch a hearty round of top-of-her-voice bye-byes to big tree and boo-boo tree alike and retrace our steps through the very-very-big woods. I can't say that I've made much headway in the molding of a big-tree hunter, but I guess time is on my side. The way I figure it, by the time Markie takes her children to see the boo-boo tree, it just might be a contender. ⊠

A crab is a crab is a crab, right? Look again! You might discover a

Constellation of Crabs



written by Julie Dunlap / illustrated by Patricia Savage / nature activity by Anne M. Runyon

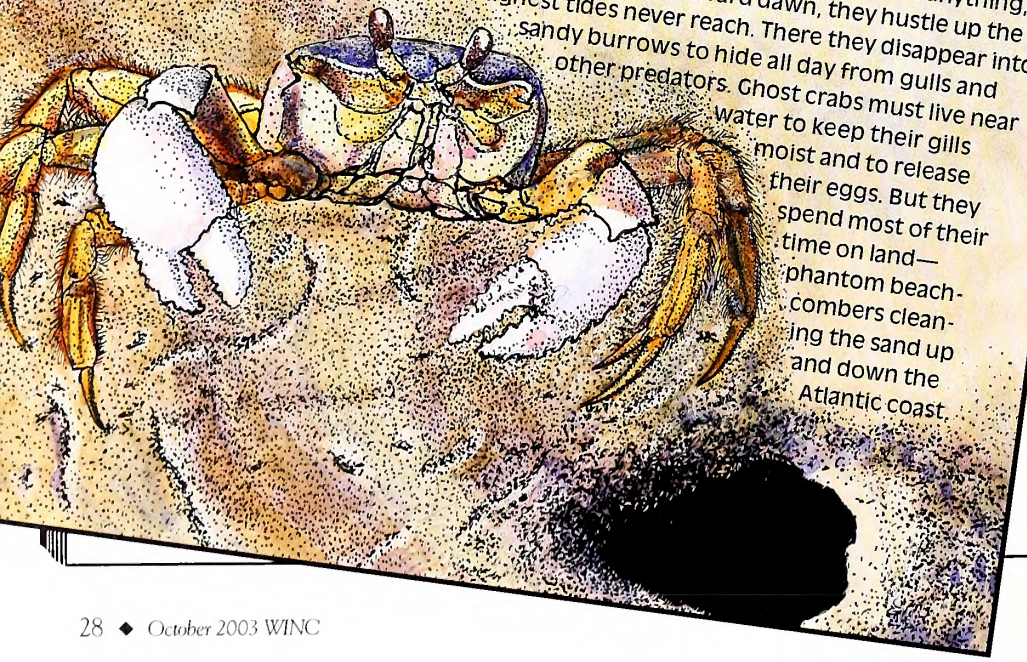
ONE BIG CRABBY FAMILY

More than 4,000 species of crabs live around the world. Most live in or near water, but some live on dry land. Some even climb trees! All crabs belong to a group of animals called **crustaceans,** whose hard outer shells protect their soft bodies. Like lobsters, crayfish and shrimp, crabs are known as **decapod**, or "10-footed," crustaceans because each animal has 10 legs. Crabs use their multi-talented limbs for walking, swimming, eating and, if you're not careful, pinching!

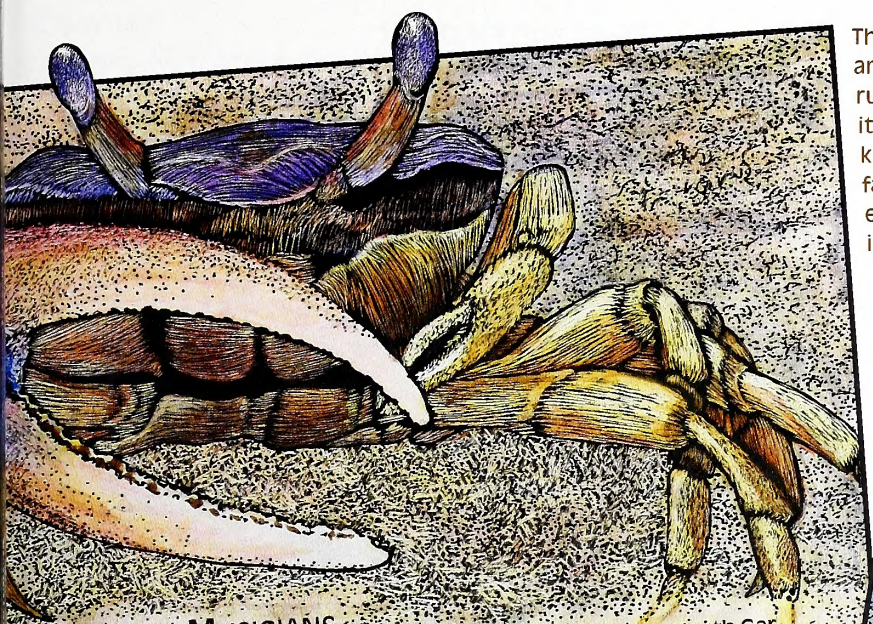
With thousands of different species, crabs can look amazingly diverse. A full-grown oyster crab can live inside an oyster's shell; a giant spider crab's legs may measure 5 feet long. Many crabs have dull-colored shells to match their mud or sand surroundings. Yet some jeweled anemone crabs are purple and orange with red **eyestalks**. Some crabs even attach sponges, seaweed or anemones to their **carapaces**, or shieldlike shells, as camouflage to help them hide from enemies. But the familiar, helmet-shelled horseshoe crab is not a true crab—or even a crustacean. These ancient creatures are more closely related to spiders.

SEASIDE SPOOKS

If you visit a North Carolina beach at night, you might see ghosts—ghost crabs, that is. Sand-colored and swift-footed, ghost crabs can vanish faster than you can say "Boo!" Ghost crabs dart across the sand all night to feed. **Omnivores**, they eat almost anything, including plants, insects, sea turtle eggs and other crabs. Toward dawn, they hustle up the beach above the strand line, where the highest tides never reach. There they disappear into sandy burrows to hide all day from gulls and other predators. Ghost crabs must live near water to keep their gills moist and to release their eggs. But they spend most of their time on land—phantom beach-combers clean-ing the sand up and down the Atlantic coast.



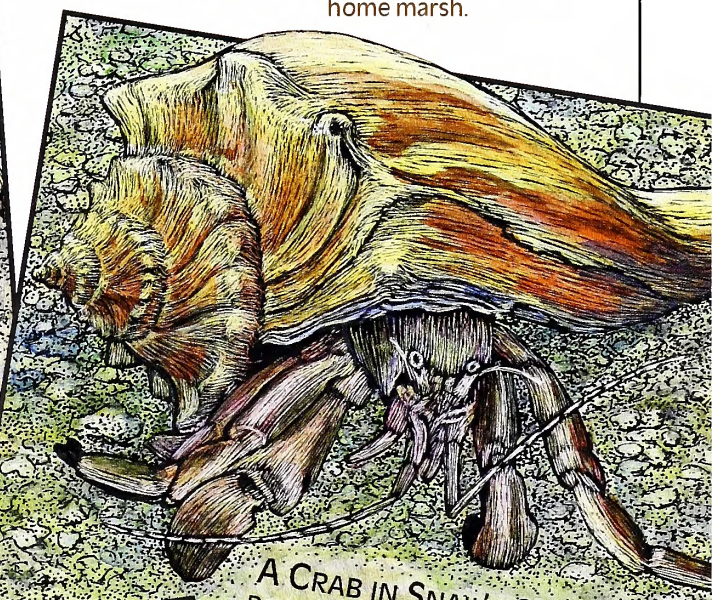
The only time male and female blue crabs get along is during mating, which occurs in **brackish** waters just as the female is **molting**. The female migrates toward the ocean to lay up to 2 million eggs. The egg mass, or **sponge**, is protected under her abdomen until the eggs hatch. Miniscule blue crab larvae, or **zoeae**, drift in the ocean with other **zooplankton**, tiny animals including thousands of other kinds of young crabs. A zoea looks nothing like an adult crab but it grows fast, molting several times. By the time it becomes a **megalops**, a young blue crab lives in a protected bay, often hiding among underwater grasses. After one more molt, the crab looks like a mini-adult. At every life cycle stage, blue crabs are eaten by fish, turtles, birds and other predators.



MARSH MUSICIANS

This burrowing crab can be spotted from boardwalks over North Carolina's salt marshes. **Fiddler crabs** scurry among the marsh grass, scooping up food-rich mud with their claws, or **chelipeds**. A female eats with both claws, but a male can use only one. The other cheliped is too long to reach his mouth. The huge claw is used to threaten other males and to wave at passing females. Chelipeds earned the name "fiddler crab" because a male moving his small claw across his large one looks a bit like he's playing the violin.

Though it can't play a tune, a fiddler crab has an amazing sense of rhythm. When the tide rises, it rushes to its burrow and seals itself inside. How does it know when to come back out? Its **biological clock** keeps track of tidal rhythms. When the water level falls again, the clock alerts the crab that it's safe to emerge. The clock is so accurate that fiddlers kept in laboratories still follow the tidal rhythms of their home marsh.



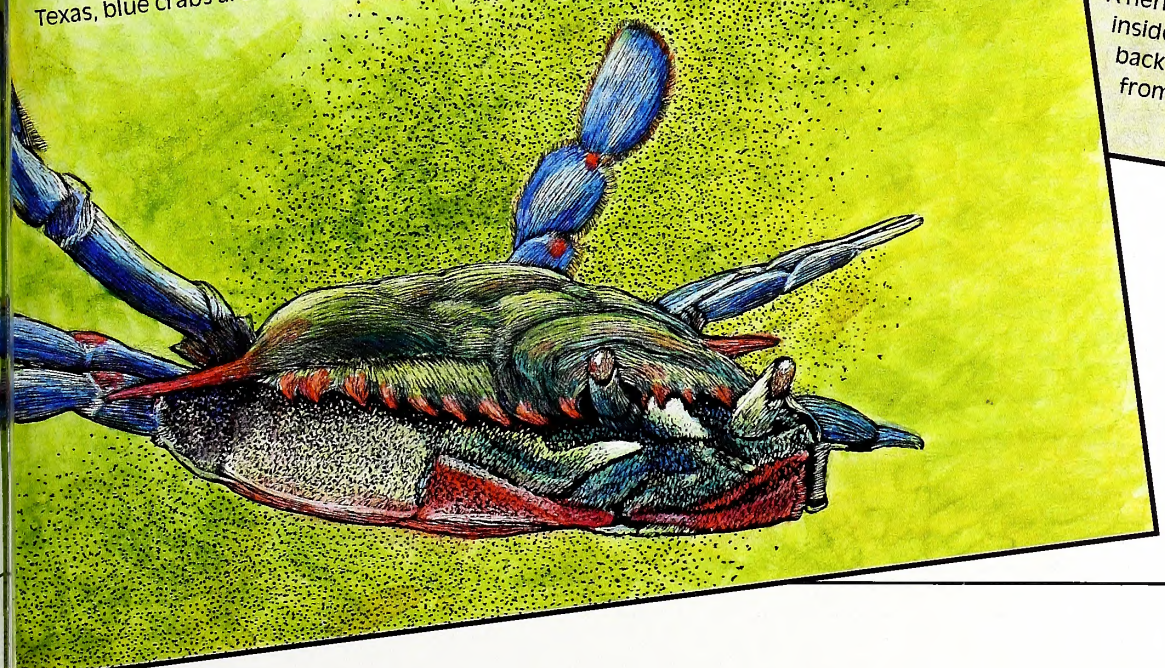
A CRAB IN SNAIL'S CLOTHING

Do you think you saw a snail scrambling across the mud flat? Chances are, that speedy shell was the mobile home of a **hermit crab**. Unlike fiddlers and other true crabs, a hermit crab has a long, soft abdomen at the back end of its body. The animal protects its abdomen inside a hard shell, usually the shell left behind by a dead marine snail. A hermit's abdomen fits perfectly inside its adopted home, and its back legs are adapted to hold on from the inside.

As a hermit crab grows, its shell may get too tight. Then the hermit must search the shores for a new shell, trying on any likely possibilities. A crab determined to find just the right house will steal a shell off another hermit crab's back.

BEAUTIFUL SWIMMERS

You might see North Carolina's most famous crab swimming underwater, thanks to its paddlelike hind legs. Easy to identify, a mature male **blue crab**, or "jimmy," sports brilliant blue claws. An adult female, or "sook," has claws tipped vivid red. Common from Massachusetts to Texas, blue crabs are admired for their tasty meat and their feisty personalities.



KEEPING CRABS HAPPY

Each year, people harvest millions of blue crabs to steam, broil, sauté and turn into crabcakes and soup. Blue crabs are treasured for their taste and for the fun of catching them. Most important, like all crabs, they're valued as part of the natural system. They are food for many animals and predators of many others. Yet crabs face threats from overfishing, beach development, oil spills and wetland draining. Biologists are experimenting with projects to help them, such as replanting underwater bay grasses that young blue crabs need to survive. By learning how to preserve and restore our beaches, marshes, bays and oceans, we can make sure that all kinds of crabs have a bright future.

What Does It Mean?

biological clock: internal timer that regulates an animal's behavior to match outside rhythms such as tides or light cycles

brackish: water with a mixture of seawater and freshwater

carapace: shell covering a crab's head and thorax

chelipeds: first pair of crab legs, tipped with claws

crustaceans: hard-shelled invertebrates with antennae and many legs

decapods: crustaceans with 10 feet

eyestalks: flexible structures supporting the eyes of crabs

megalops: stage in crab life cycle between zoea and immature adult

molting: shedding outer covering (such as shell)

omnivore: an organism that eats both animal and vegetable food

sponge: egg mass attached underneath a female crab's abdomen

zoea: the hatchling stage in a crab's life cycle

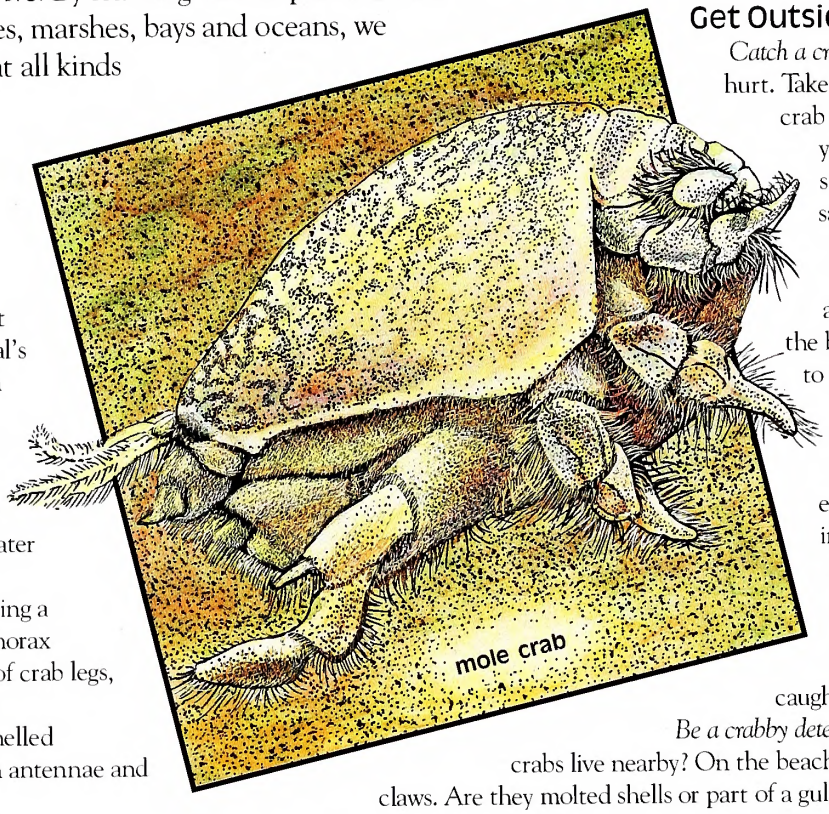
zooplankton: microscopic-sized animals drifting in ocean water

Read and Find Out

- "Clockers" by John Palmer, *The Sciences*, September/October, 1998.
- *Crabs* by Sylvia Johnson, Lerner Books, 1982.
- *Hermit Crabs* by Sylvia Johnson, Lerner Books, 1990.
- *Meet the Arthropods* by Ellen Doris, Thames and Hudson, 1996.
- *Pugoo* by Holling Clancy Holling, Houghton Mifflin, 1990.

On the World Wide Web:

- www.fiddlercrab.info



Get Outside

Catch a crab. Careful! Crab pinches can really hurt. Take along a net whenever you go out crab hunting. For catching blue crabs, you'll also need a chicken neck on a string. Dangle your bait into shallow, salty water and wait for a bite. Scoop up your prize with the net and observe it in a bucket. If you're after ghost crabs, take a flashlight to the beach for a night hunt. You'll have to work fast to net ghost crabs—they dart every which way and seem to vanish just outside your flashlight beam. Mole crabs are the easiest to catch and are safe to hold in your hand. Just dig in the sand right at the edge of the waves. Whenever you collect crabs for observing, don't forget to release them soon, right where you caught them.

Be a crabby detective. What clues can you find that crabs live nearby? On the beach, you may discover carapaces or claws. Are they molted shells or part of a gull's crab lunch? On an undisturbed beach, you may find the criss-cross tracks of fast-moving ghost crabs. Can you trail a ghost to its sandy den? You might also notice small sand pellets around a fiddler burrow. What do you think they are? And when you're fishing for blue crab, try different baits. Which one attracts crabs most quickly? Why might it work best?

Visit the N.C. Museum of Natural Sciences or the state aquariums. At the Museum, explore the Coastal North Carolina exhibit to find mole, ghost, fiddler and blue crabs, each in its natural habitat. Also look for live crabs in the Arthropod Zoo. All three state aquariums offer touch tanks with hermit crabs, spider crabs and other species. Roanoke Island Aquarium also hosts "Catch a Crab" field trips, where visitors can harvest and cook their own blue crabs with expert help. Call Roanoke Island for field trip details at (252) 473-3493. For aquarium crab-related events, call Fort Fisher Aquarium at (910) 458-8257 and Pine Knoll Shores Aquarium at (252) 247-4003.

It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

Marsh Munchers teaches students to identify a salt marsh food web.

Are You Me? teaches students to identify the young stages of aquatic animals and match them with corresponding adult stages.

Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at www.ncwildlife.org and click the link for education/workshops.

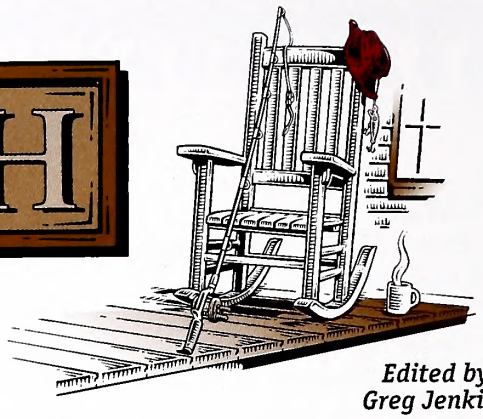
The Little Wanderer, a Hidden Picture

The Little Wanderer, *Planus minutus*, is a swimming crab adapted to life in the Sargasso Sea. Large mats of seaweed, called sargassum, float near the surface of the deep ocean and shelter a variety of small marine animals. Most are mottled brown like the seaweed, and all drift in the currents flowing clockwise around the North Atlantic Ocean. Sometimes a clump of sargassum drifting in the Gulf Stream current will wash up on a North Carolina beach.

Look carefully at the Hidden Picture. You may find the Little Wanderer hidden in the tangle. Other things are hidden here, too. Can you find a crab net, a flying fish, a wahoo, a tern and a trawler?

BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

Martin Joins *WINC* as Editor

Wildlife in North Carolina has a new editor with an extensive background in natural sciences and publishing. Durham native Margaret Martin comes to the magazine after a nine-year stint at the N.C. Museum of Natural Sciences, where she was director of external affairs. Martin was responsible for special projects and educational publications, including the *North Carolina Naturalist*, the museum's quarterly magazine. She started at *WINC* on July 1.

JODY DUGGINS

"This magazine is one of the best of its kind in the country," Martin said. "I want to continue its tradition of great wildlife stories and photography."

Martin is a graduate of N.C. State University and author of the book *A Long Look at Nature*, published in 2001 by UNC Press.

"We are so fortunate to have Margaret on our team. She brings a wealth of experience that will contribute to the commission's charge to educate and inform through the magazine," said Ginger Williams, chief of the N.C. Wildlife Resources Commission's Division of Conservation Education.

In her free time, Martin enjoys music and hiking. She lives in Raleigh with her husband, Wayne, and teenaged sons, Tom and Joey. Martin may be reached at margaret.martin@ncwildlife.org or (919) 733-7123, ext. 268.

Biologists to Conduct CWD Testing This Fall

This fall, N.C. Wildlife Resources Commission biologists will test at least 1,000 free-ranging white-tailed deer for chronic wasting disease (CWD), a communicable neurological disease of deer, elk and related animals. CWD, which has not been found in North Carolina, is characterized by microscopic empty spaces in the brain matter, creating a spongy appearance. Afflicted animals exhibit unusual behavior and eventually die. Animals may be infected five years or more before showing symptoms, but once they do, death is certain. There is no treatment or cure.

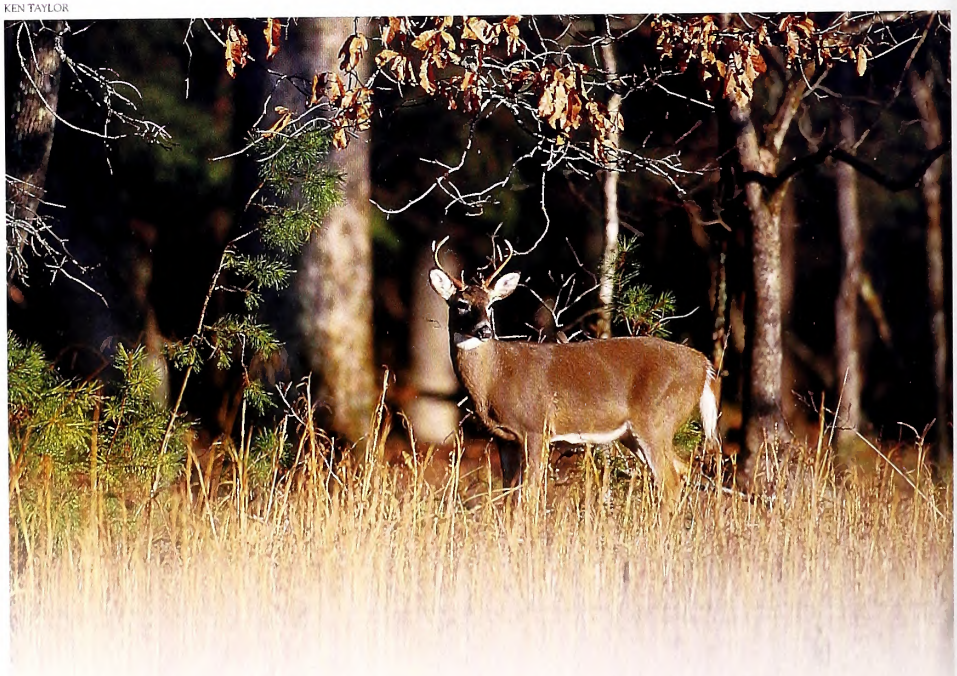
Priority will be placed on testing deer exhibiting signs of the disease. Since the only reliable test for CWD requires tissue from the brain stem or lymph nodes, samples cannot be taken from live deer. Biologists intend to collect the majority of the samples from hunter-harvested or road-killed deer. Systematic collection will follow guidelines based upon deer population estimates to ensure statistically valid results. Tissue samples will be sent to the only testing facility in the South for CWD, the Southeastern Cooperative Wildlife Disease Study in Athens, Ga.

The commission encourages hunters who harvest or observe a deer with clinical signs of CWD to report the animal at 1-800-662-7137.

Signs of CWD

- Extremely low weight
- Listlessness
- Lack of coordination or other neurological symptoms
- Frequent lowering of the head
- Blank facial expressions
- Repetitive walking in set patterns
- Drooling and grinding of teeth
- Drinking lots of water and increased urination

KEN TAYLOR



In memoriam: Longtime Wildlife Commissioner

Polie Cloninger

Polie Q. Cloninger Jr., whose third term on the N.C. Wildlife Resources Commission ended in April, died July 20 while fishing with family and friends in Anchorage, Ala. Cloninger was appointed to the commission by Governor Jim Hunt to consecutive four-year terms in 1977 and 1981, and was reappointed by Hunt for a six-year term in 1997 after a 12-year absence from the commission.

"Polie Cloninger served the fish and wildlife conservation programs of North Carolina and the millions of citizens who enjoy fishing and hunting with distinction for more than 12 years as a wildlife commissioner," said Richard Hamilton, assistant director of the wildlife commission. "Polie was an avid outdoorsman, and much of his considerable knowledge of fish and wildlife came from actual experiences afield. He was a leader in fish and wildlife conservation and always took a strong stand on the side of fairness and support for the resource. The Wildlife Resources Commission will miss this man."

Cloninger, who was 74, was mayor of Dallas from 1963–66. He was a Gaston County commissioner from 1966–82, and served as a Dallas town alderman from 1983–95. The owner of Dallas Wholesale Textile Co., Inc., Cloninger

COURTESY OF CLONINGER FAMILY

was an active member of Holy Communion Lutheran Church for 53 years, a trustee of Gaston Memorial Hospital from 1993–97 and chairman of the local board of directors of First Union National Bank.

As wildlife commissioner, Cloninger served on committees dealing with law enforcement and boating, game and fisheries, legislative issues, warmwater and coldwater fishing and small game. His term expired on April 25 of this year. His seat was filled by fellow Dallas resident David W. Hoyle Jr. on July 16, four days before Cloninger's death.

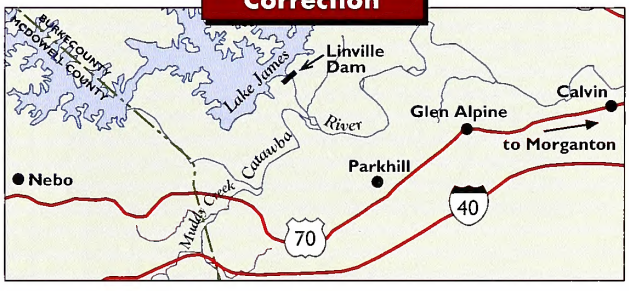
Cloninger is survived by his wife, Mary Jo; two sons, Thomas and Alan; a daughter, Paula Houser; and six grandchildren. Memorials may be made to Gaston College, Polie Q. Cloninger Scholarship Fund, 201 Hwy. 321, Dallas, NC, 28034; Holy Communion Church, 103 W. Church St., Dallas, NC, 28034; or Hope Lutheran School, 3430 Robinwood Rd., Gastonia, NC, 28054.

Hoyle Appointed to Commission

David W. Hoyle Jr. of Dallas (center) was recently sworn in as a member of the Wildlife Commission representing District 8. Hoyle, whose six-year term expires in 2009, was appointed by Governor Mike Easley. Hoyle's father, state senator David W. Hoyle Sr. (right), administered the oath of office at the July 16 commission meeting. Also pictured is Wildlife Commission Chairman John E. Pechmann.

JODY DUGGINS

Correction



A map accompanying the article "Tale of a Tailrace," August 2003, omitted the Linville Dam, shown here at the head of the Catawba tailrace.

Wildlife through the Year

Ghosts, Goblins and Gourds

ILLUSTRATED BY DAVID WILLIAMS

Autumn is the time of year when most gourds have matured on the vine and are ready for picking. You'll know they're ready when the stems turn brown and dry. All gourds should be harvested before the first frost.

In addition to their decorative value, gourds of the correct size and shape also make excellent birdhouses. In fact, there is even a type called a birdhouse gourd that is perfect for housing avian guests. If you haven't grown any, they usually can be purchased from your local farmer's market.

Wash your gourd with soap and water, then apply rubbing alcohol to help dry its outer surface. Next, place your gourd in a dry, dark environment to allow it to dry on the inside.

By late winter, your gourd will dry to a thick, hard shell. Then just drill a hole sized for the bird species you hope to house, and set out your gourd house for early spring arrivals.

—Chris Powell

Partners in Flight Coordinator Honored

JOON POWELL

***Johns has worked** to bring schools, industries and conservation groups together for the betterment of birds.*

N.C. Partners in Flight coordinator Mark Johns, a biologist with the N.C. Wildlife Resources Commission, has been awarded the 2003 Wildlife Stewardship Award in the Industry Cooperator category by the American Forest and Paper Association. Johns was selected for the honor because his efforts to further bird conservation for the past four years have created a coalition of government agencies, conservation organizations, private industry, the academic community and individual citizens to promote education, habitat conservation and research.

"This comes as a complete, but very pleasant, surprise to me," Johns said. "This is solid proof that the N.C. Wildlife Resources Commission's long-term support of the coordination of the Partners in Flight (PIF) program in North Carolina is worthwhile and important, and that N.C. PIF is recognized by others as important. North Carolina has many talented, dedicated individuals involved with bird conservation efforts, making my work with N.C. Partners in Flight a great learning and growing experience for me."

The award presentation was held at the Sustainable Forest Initiative Program's annual conference in Denver, Colo. Johns has worked with the Wildlife Commission for seven years.

On Patrol

ILLUSTRATION BY JACKIE PITTMAN

To check for late shooting during duck season, Master Officer Jeffrey Isley entered an area near High Rock Lake close to the end of shooting time. Isley and fellow officers located and watched two hunters, one of whom shot a wood duck almost 45 minutes after shooting time. The hunters boarded a boat and headed up a small creek near the lake. Because the creek was too deep and wide to wade, Isley quickly walked out onto a sandbar and motioned for the hunters to come over. The officer was wearing a camouflage coat and it was fairly dark, so the hunters came his way. Isley held the side of the boat with one hand and unzipped his coat with the other hand to reveal his uniform. Both hunters moaned and hung their heads. In addition to being charged with late shooting, they were cited because their boat had an expired registration, no life jackets and no lights.

100 Years of Wildlife at the State Fair

Visitors to the N.C. Wildlife Resources Commission's exhibit at the N.C. State Fair Oct. 17–26 will enjoy "100 Years of Wildlife Conservation," a theme commemorating the centennial of the passage of the first wildlife protection laws in North Carolina.

The handicapped-accessible exhibit will give all visitors a chance to learn about historically significant conservation projects, programs and regulations designed to benefit fish and wildlife. The display uses oversized photographs and habitat re-creations to illustrate conservation efforts in North Carolina during the past century. Visitors will see live turtles in a small pond and learn about one of the commission's latest nongame conservation efforts: a new turtle protection law that became effective July 1. The Enforcement Division's new Sensory Safari, a walk-through trailer featuring preserved skins, skulls, duck wings and wildlife videos, will be open to visitors.

This year's wildlife button—a free, traditional state fair collector's item—features a box turtle, North Carolina's official state reptile. Commission biologists, educators and enforcement officers will be on hand to answer questions. At the N.C. WILD Store visitors can purchase posters, subscribe to *Wildlife in North Carolina* magazine and buy wildlife T-shirts, including this year's commemorative turtle T-shirt.

For state fair information, check http://www.ncstatefair.org/.

WINC Wins Eight National Awards

ASSOCIATION for CONSERVATION INFORMATION, INC.

Wildlife in North Carolina cleaned up at the annual Association for Conservation Information (ACI) national awards ceremony held July 29 in Cody, Wyo. *WINC* won eight awards, including first-place honors for Web site and first place in the Parks, Historical and Cultural Article category for Carl Betsill's story, "World of Wounds," September 2002. The magazine was judged third-best in the nation behind state wildlife publications from Nebraska and South Carolina.

WINC's second-place awards were in the Posters category for the "Snakes of North Carolina" series and in the One-Time Publication, Four-Color Brochures class for "Growing Wild: A Wildlife Habitat Site." The magazine took home third-place honors in Photography for Jody Duggins' work on "A Seaworthy Craft," June 2002; in Magazine Fisheries Article for Brad Deen's story, "Sea Change," July 2002; and in Calendars for the 2002 N.C. Wildlife Calendar.

Nature's Ways

State Fair Sunflowers

written by Clyde E. Sorenson
illustrated by David Williams

Every October, you can count on two things: The State Fair is coming to Raleigh, and roadside ditches and field edges in the eastern two-thirds of North Carolina will be illuminated by bursts of brilliant-yellow swamp sunflowers.

Swamp sunflower (*Helianthus augustifolius*) is a perennial relative of domestic sunflowers (about 20 other wild sunflower species occur in the state). Individual plants may reach 8 feet in height, and an older plant may have dozens of stems, each with as many as 50 2-inch blooms. Typically, all the flowers on a plant will open within a few weeks, creating the spectacular displays we see.

Blooming late in the fall has at least a couple of advantages. First, competition for pollinating insects is fairly low, since relatively few other plant species are also blooming. Second, maturing a seed crop late in the year reduces the likelihood that insect seed predators will be able to exploit it.

This strategy does have a major disadvantage: an early frost can destroy the plant's seed crop before it has a chance to mature. And although seed-feeding insects may be less abundant, American goldfinches and other birds relish the tiny swamp sunflower seed as much as they do the domestic variety in your bird feeder.

did YOU know?

Researchers say their annual survey of water quality along the Outer Banks is encouraging for the sixth consecutive year. Soundside testing was conducted by scientists from N.C. State University's Center for Applied Aquatic Ecology at nine popular tourist locations, from the Alligator River National Wildlife Refuge down to Hatteras village. The spring survey detects the occurrence of the toxic microbe *Pfiesteria* and other harmful algae. "Overall water quality remains excellent all along the Outer Banks," said JoAnn Burkholder, professor of aquatic botany and the director of the center. "Nutrients, chlorophyll—an indicator of algal growth—and fecal coliforms were low."

The water-quality testing is part of an ongoing program by Burkholder's lab to monitor coastal waters. The researchers conduct water-quality tests along the barrier islands two or three times a year, which provides benchmark information for a variety of scientific studies. They plan to conduct more tests later this year to ensure that water quality along the Outer Banks remains high. Burkholder, who co-discovered *Pfiesteria* in 1989, noted that the toxic microbe has never been found along the Outer Banks. More information is available at www.pfiesteria.org.

Muskie Club Provides Food for Hatchery

The Western North Carolina Muskie Club recently provided Table Rock State Fish Hatchery with $1,050 worth of goldfish brood stock for use as feeder fish for muskellunge fingerlings. The hatchery lost a large portion of its goldfish brood stock to predators during the winter, causing concern that not enough stock remained to provide adequate forage for the muskies this summer. Muskie club members volunteered to pay for replacement goldfish to ensure that the muskie stocking program could continue uninterrupted.

KEN TAYLOR

"For some time, the muskie club has been looking for ways to help out," said Don Funderud, president of the club. "This looked like an opportunity to put the funding where it would do the most good."

The goldfish will be cultured in ponds operated by the N.C. Wildlife Resources Commission's Division of Inland Fisheries, then used as feeder fish for muskie fingerlings at Table Rock. Fingerlings at 10 to 12 inches long will be stocked in the French Broad River in October. Stocking of juvenile muskies is necessary for a successful muskie fishery in the river, which does not support a natural fishery.

Wildlife Endowment Fund Report

Fund Balance $53,946,647.28

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

Calendar of Events

FRIDAY–SUNDAY, OCT. 3–5

Entertainment and tons of food from local waters are the main attractions at the N.C. Seafood Festival in Morehead City. Call (252) 726-6273, e-mail fun@ncseafoodfestival.org or visit www.ncseafoodfestival.org.

FRIDAY–SUNDAY, OCT. 10–12

Instructors offer tips on equipment, fish identification, casting, bait and more during the Surf Fishing Weekend Workshop in Atlantic Beach sponsored by the N.C. Aquarium. Call Sherry White at (252) 247-4003 or visit www.ncaquariums.com.

SATURDAY–SUNDAY, OCT. 11–12

A show celebrating wildlife art and conservation will be held in the New Bern Riverfront Convention Center. Call (252) 638-5781 or log on to www.mumfest.com.

TUESDAY–SUNDAY, OCT. 14–19

The Wings Over Water Festival in the Manteo area offers environmental exhibits, children's activities, field trips and outdoor recreation. Visit www.wingsoverwater.org or call the Outer Banks Chamber of Commerce at (252) 441-8144.

FRIDAY–SUNDAY, OCT. 17–26

Enjoy craft demonstrations, livestock exhibits, midway games and rides, concerts, food and much more at the state's largest event, the North Carolina State Fair in Raleigh. Call (919) 733-2145 or visit www.ncstatefair.org.

SATURDAY, OCT. 25

- Support the Karen Beasley Sea Turtle Rescue and Rehabilitation Center in Topsail Beach by attending the Turtle Ball, a black-tie charity event. Call the Greater Topsail Chamber of Commerce at (800) 626-2780.
- Change fears to fascination by meeting snakes, spiders, alligators and other live animals at Natural History Halloween, for kids ages 2–12 at the N.C. Museum of Natural Sciences in Raleigh. Enjoy games, activities and a costume contest. Visit www.naturalsciences.org or call (919) 733-7450.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to greg.jenkins@ncwildlife.org, or call (919) 733-7123, Ext. 264.

Double-crested cormorant

F. EUGENE HESTER

Cormorant Confusion—Anhinga Answers

Our mission at *Wildlife in North Carolina* magazine is to educate and inform our readers, but often we learn something ourselves. In the Back Porch section of the June 2003 issue, we ran a note about a U.S. Fish and Wildlife Service proposal to transfer management of the double-crested cormorant from federal to state governments.

Problem was, the photo that accompanied that note was not a cormorant but its cousin, the anhinga. Here's how to tell the birds apart:

Double-crested cormorant

- Brownish-black plumage; orange throat patch.
- "C" is shaped like a haak, and the carmorant has a hoak at the end af its long bill.
- "C" stands for cantinuaus flight pattern—it must flap continuously.
- Flies low with curved neck and rapid, duck-like wing beats.
- Shorter tail; webbed feet used far swimming.
- Nicknamed "sea crow" because of its dark plumage.
- Catches fish with its strang hooked bill.
- Habitat is fresh or saltwater areas in cantinental United States, including Atlantic and Pacific coasts, Mississippi River corridor and Great Lakes.

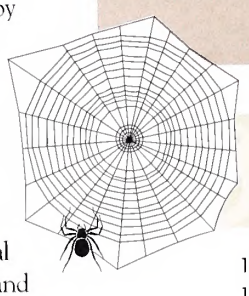
Anhinga

- Black plumage with green tint; silvery white patches an wings.
- "A" is a painted letter, and the anhinga has a pointed beak.
- "A" stands far alternating flight pattern—it both saars and flaps.
- Flies with its neck and wings straight out.
- Lang tail fans aut for use in swimming.
- Nicknamed "snake bird" because it swims with body underwater and long, thin neck and head abave water.
- Spears fish with painted beak and flips them inta its mauth.
- Habitat is freshwater swamps, marshes and lakes of sauth-eastern United States sauth ta Argentina.

In areas such as coastal North Carolina where their habitat overlaps, double-crested cormorants and anhingas can sometimes be seen fishing and roosting next to one another. Thanks to our alert readers who noticed the error. We hope you, like we, will now be able to tell these birds apart in the wild.

Anhinga

MASLOWSKI PHOTOGRAPHY



Catch Us at these *Numbers*

1-800-662-7137 to report violotions of hunting ond fishing lows

1-800-628-3773 (NC VESSEL) for boot registrotion ond titling

1-800-675-0263 for hunting dotes ond shooting hours for migrotory gome birds

1-888-248-6834 (2HUNTFISH) to purchose most licenses with VISA or MosterCord using o touch-tone telephone

1-800-446-8663 (I GOT ONE) to report big gome horvests

Connect to the Wildlife Commission's online Web site ot www.ncwildlife.org

Calls are answered in order, but some numbers may require a wait during busy seasons.

N.C. WILD STORE

A *Winter* PORTFOLIO

by Bob Timberlake

Snow falls on a tin roof while turkeys stand watch in the gray light. A long-abandoned farm wagon fills up with snow. These two winter scenes by North Carolina artist Bob Timberlake make up a special edition that we can offer for a limited time only. Reproduced in offset lithography, "*Nay's Turkeys*" and "*Covered Wagon*" are printed on museum quality archival stock and numbered as a matching set. Both reproductions are hand-signed by the artist; they include hand-deckled edges and debossed panels around the image. Overall size on each reproduction is 15 3/4" x 20"; the image size is 10 3/4" x 16".

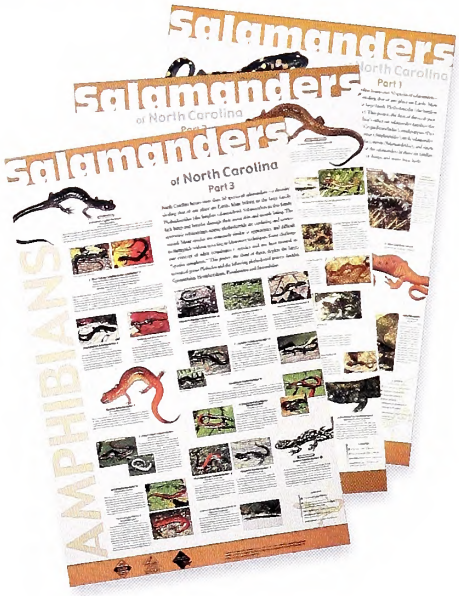
Orders will be accepted only until November 15, 2003. The edition size will be determined at the end of the reservation period.

PRINT SET
$250 ITEM CODE FA2

A $15.00 shipping fee and N.C. sales tax apply.

See our order form on page 41.

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.



◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

▲ Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

▲ Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

left front design

Largemouth Bass. This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12LRG** (large)
A12XXL (extra extra large)
Extra large size is no longer available.

left front design

Snow Geese. Celebrate waterfowl conservation with this white, all-cotton tee. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

Wild Turkey. A timeless spring scene makes this all-cotton tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

Sporting Dogs of North Carolina Poster Set
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail and tree. Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

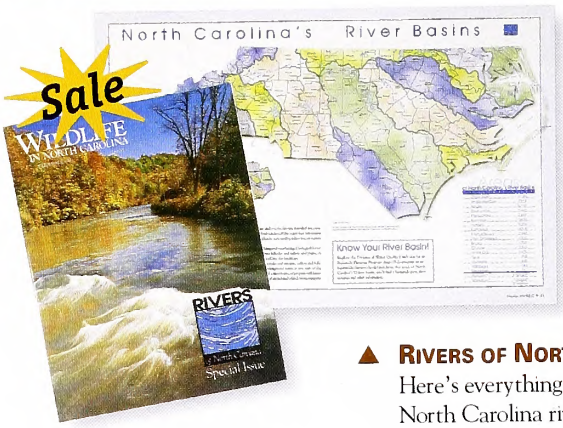
Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams. Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

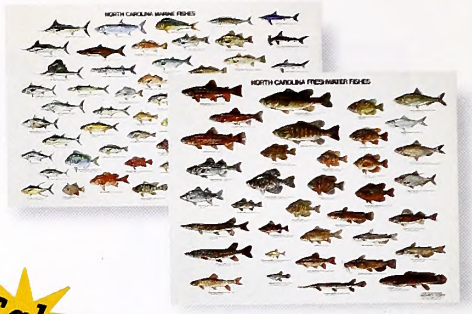


▲ Rivers of North Carolina

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* (Nov. 1999) chronicles the natural history of 17 major river basins.

Half-price while supplies last.

$5 ITEM CODE M11



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE P9

◀ Dogs that Point, Fish that Bite

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

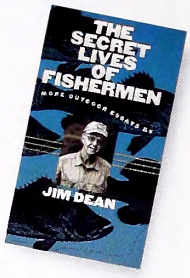
Hardbound ~~$19.95~~ $14.95

ITEM CODE M8

Paperback ~~$10.95~~ $8.00

ITEM CODE M12

Set of both volumes
Hardbound $30.00
ITEM CODE M14



The Secret Lives of Fishermen ▶

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound ~~$24.95~~ $18.50

ITEM CODE M13

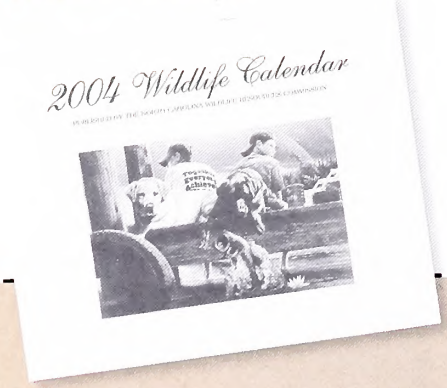
2003 N.C. Migratory Waterfowl Print and Stamp ▶

Buy North Carolina's 21st waterfowl print and stamp, and contribute to wetlands conservation. Wilhelm Goebel's "Traditions at Suggs Mill Pond" depicts the artist and his daughter hunting on a blackwater bay. Overall size: 12" x 14"; image size 6 1/2" x 9". Includes a free museum print of Ron Louque's "Canvasbacks at Whalehead."

No shipping-handling fee or discount applies.

Print and Stamp $145 ITEM CODE DSP03
Stamp Only $10 ITEM CODE DSPS 03

2004 North Carolina Wildlife Calendar ▼



2003–2004 Federal Duck Print and Stamp ▶

Greater snow geese take wing over the Chincoteague National Wildlife Refuge on the 70th edition of the federal duck stamp. Artist Ron Louque is making signed prints of the stamp available, and we have a limited number. Overall print size: 12" x 14"; image size: 6 1/2" x 9". Includes a free museum print of the artist's "Canvasbacks at Whalehead."

A $9.50 shipping and handling fee applies.
This item not subject to 15% discount.

Print $189 ITEM CODE FDSP03
Stamp $16 ITEM CODE FDSS03

A Great Gift!

Place your order now. Complete and mail to CALENDAR, N.C. Wildlife Resources Commission, 1710 Mail Service Center, Raleigh, NC 27699-1710. To order by phone, call (919) 662-4377. Order online after September 1 at www.ncwildlife.org, or visit the sales office at 322 Chapanoke Road in Raleigh. (Allow 3 weeks for delivery.)

Complete the form below.

Name _____

Address _____

City/State/Zip _____

Calendar Costs:

1 to 9	$6 each
10 to 25	$5.50 each
26 to 199	$5 each

Please send _____ N.C. Wildlife Calendars at $_____ each. $_____

N.C. residents add 7% sales tax. $_____
(Wholesale orders are exempt from sales tax with a completed Certificate of Resale.)

Total $_____

ALL ORDERS MUST BE PREPAID BY CHECK, MONEY ORDER OR CREDIT CARD.

☐ Check or money order enclosed made payable to NCWRC. ($20 charge on returned checks—N.C.G.S. 25-3-512.)

☐ VISA MasterCard # _____ Exp. ____/____

Signature _____ Phone ( ) _____

DELAYED GRATIFICATION

WILDLIFE COMMISSION SPOTLIGHT

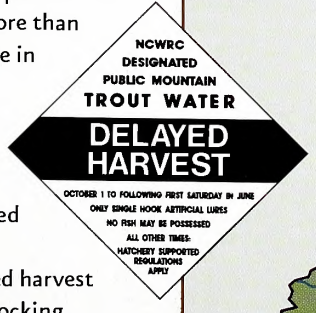
An angler fishes a section of East Prong Roaring River, one of 17 sites in the Wildlife Commission's delayed harvest program.

JODY DUGGINS

One goal of the N.C. Wildlife Resources Commission's stocked trout waters program is to boost trout fishing opportunities in the state. By delaying harvest of trout stocked in designated sites, the commission's delayed harvest program provides anglers with high quality catch-and-release fishing opportunities from October to June. Anglers may harvest trout during the summer months when stream conditions become less favorable for the survival of stocked trout.

Because of the high expected-catch rate of one to two trout per hour and the 8-month-long catch-and-release season, angler interest in the delayed harvest program has risen dramatically since the program began in 1991. From four original streams, the commission has expanded the program to 17 sites covering more than 55 miles of streams and one lake in 14 counties in western North Carolina. Stockings for the delayed harvest program account for 30 percent of the 700,000 catchable trout stocked annually in North Carolina.

For a complete list of delayed harvest streams, regulations, weekly stocking information and trout fishing maps by county, visit the commission's Web site at www.ncwildlife.org.



New Delayed Harvest Streams

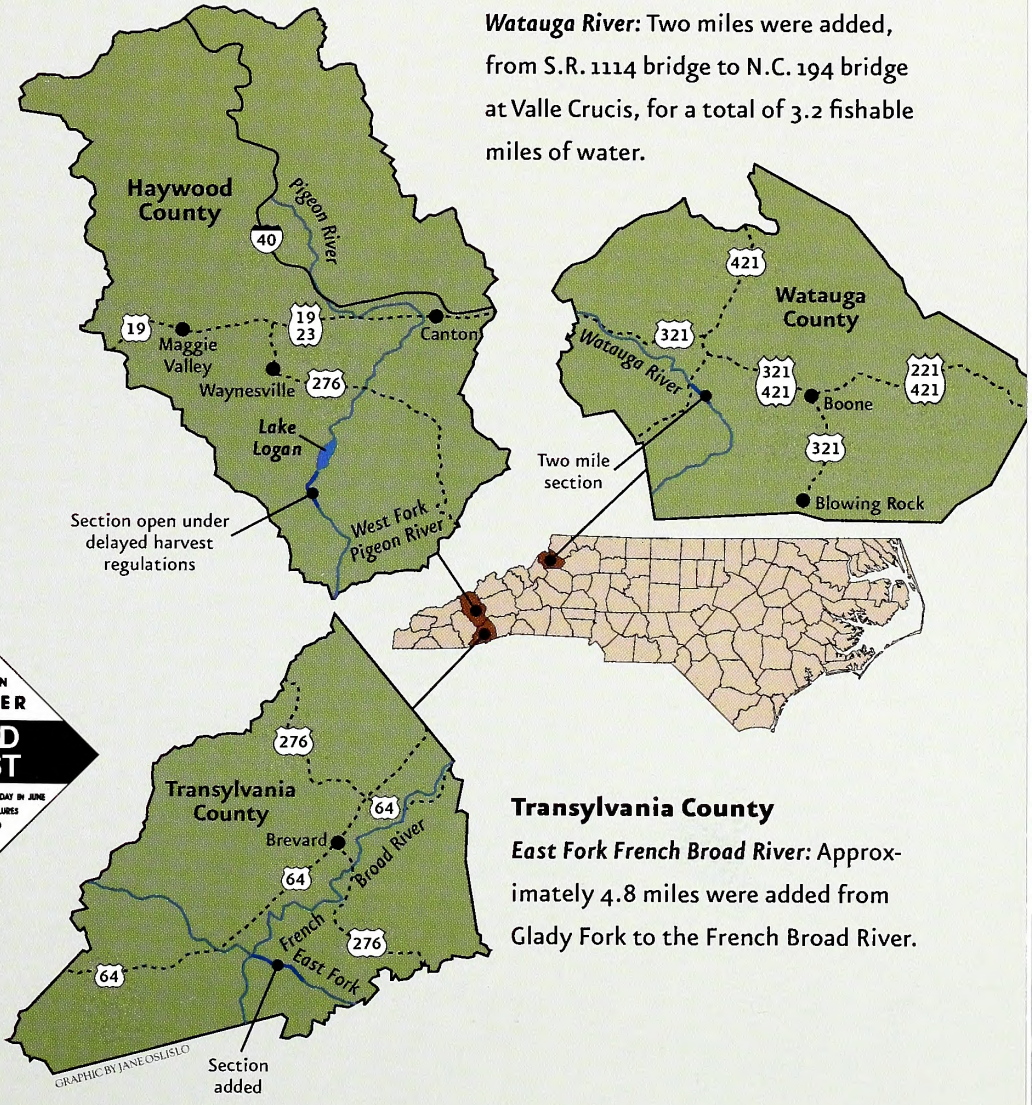
Sections of rivers in these counties were recently added to the delayed harvest program.

Haywood County

West Fork Pigeon River: Two miles located from Queen Creek to the first game-land boundary upstream of Lake Logan are open under delayed harvest regulations.

Watauga County

Watauga River: Two miles were added, from S.R. 1114 bridge to N.C. 194 bridge at Valle Crucis, for a total of 3.2 fishable miles of water.



Transylvania County

East Fork French Broad River: Approximately 4.8 miles were added from Glady Fork to the French Broad River.

Hard Hunting

A hunter pulls his boat through a salt marsh after a morning of rail hunting. For more on this almost-forgotten sport, see page 8.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

7:67/11

WILDLIFE IN NORTH CAROLINA

NOVEMBER 2003 $2.50

The Queen of Clubs

by Jim Dean

LAWRENCE S. EARLEY

Chances are most North Carolinians have never heard of the Currituck Shooting Club at Corolla, on the northern Outer Banks. That would have been just fine with the sportsmen who founded the club in 1857, and anonymity would not have bothered subsequent members. All any of them wanted was to escape occasionally from their busy lives up North and renew their spirits in one of the most remote coastal areas left on the East Coast. And, of course, to hunt ducks.

The dream lasted far longer than they might have expected. Only in the past 20 years or so has the narrow barrier island that separates Currituck Sound from the Atlantic Ocean been largely gobbled up by expensive vacation homes. Over the same period, the sound has become saltier, eliminating many of the aquatic plants that attracted countless ducks and geese and made Currituck famous worldwide as a sportsman's mecca for waterfowl and largemouth bass. But the final blow came on March 24, 2002, when the wooden clubhouse burned to the ground. Listed on the National Register of Historic Places, it had stood for 123 years.

It is a sad and nearly incalculable loss. Despite the club's relative obscurity, few buildings anywhere bespoke a more important heritage. Along with its sister hunting clubs on Currituck Sound—the Whalehead Club, Swan Island Club, Monkey Island Club, Narrow's Island Club, Pine Island Club and others—the Currituck Shooting Club helped usher in the notion of hunting solely for sport, while protecting and enhancing renewable wildlife resources.

Most of the clubs were built after the Civil War by Northern industrialists who bought the land and marshes for as little as 10 cents an acre. Yet because the clubs brought jobs to a depressed area, they were generally welcomed. It did not hurt that these Yankee interlopers shared the Currituck natives' zeal for hunting—often hiring them as guides or caretakers. Indeed, despite their clearly privileged intrusion, the clubs not only bolstered the local economy but also served to protect the sound's unique resources for more than a century. It was on Currituck Sound that Joseph Knapp initiated a conservation corps that later became Ducks Unlimited. However you choose to judge hunters, it is a stunning legacy.

"Despite the club's relative obscurity, few buildings anywhere bespoke a more important heritage."

Some people would argue that the Currituck Shooting Club, with its extensive, well-tended marshes and clubhouse, was the queen of the clubs. She was the real thing, with a certain rough and understated class, strictly for hunters and hunting—quite unlike the nearby Whalehead Club with its elegant, Gatsby-era styling and Tiffany light fixtures.

Speaking of privilege, I had an exquisite taste of it one morning in the early 1970s when a rare invitation was extended to several employees of the N.C. Wildlife Resources Commission to hunt the Currituck Shooting Club's marshes. We had been attending a commission meeting in Duck, and Clyde Patton, then executive director of the commission, asked me to share his blind.

We had some shots, but Mr. Patton (he was always Mr. Patton to everyone) delicately explained our lack of success by noting that our shooting "ran true to form." At noon, we returned to the clubhouse, where we were served oyster stew in the large sitting room surrounded by sporting artifacts, decoys and mounted waterfowl, including a massive swan in flight. After lunch, I walked around the grounds, marveling at this amazing oasis situated between marsh and dune under an endless wintry sky.

At the docks, I paused to ponder a fenced enclosure built low in the water. A black Labrador retriever was wading in the shallow water nearby, seemingly looking for something.

"You're wondering what that is, I'll bet," said a man sitting on the dock. "It's where we keep live softshell blue crabs."

"Oh," I said, "so you catch them and keep them alive until it's time to fry up a batch."

"I don't, but he does," he replied, pointing to the Lab.

"You're kidding," I said.

"Nope, that dog seems to know which ones can't bite him. When he finds a soft crab, he gently carries it to the impoundment and drops it."

"But there aren't any softshells here this time of year," I said.

"Well, that's true enough, but he don't know that. He hunts 'em year-round."

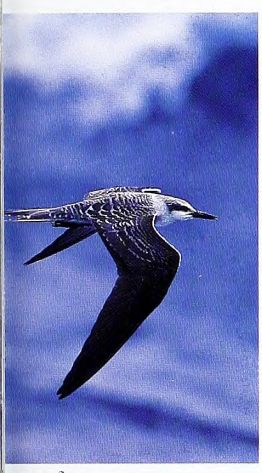
I have often wondered if that Lab's descendants are still hunting softshells somewhere. Pity it's not at the Currituck Shooting Club.

Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

November 2003 *Volume 67, Number 11*



page 2

Features

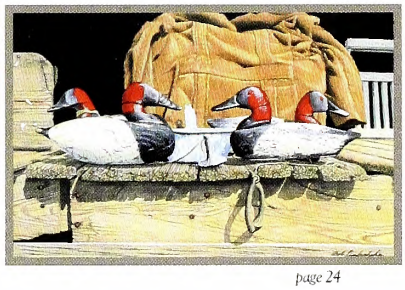
2 **The Perfect Birds** *written by Jamie Cameron*
photographed by Brian Patteson
Famous for outstanding fishing, the blue waters of the Gulf Stream are also a birder's paradise.

6 **Why We Hunt** *edited by Chris Powell*
illustrated by Chris Armstrong
We asked a cross-section of hunters what the sport means to them. This is what they had to say.

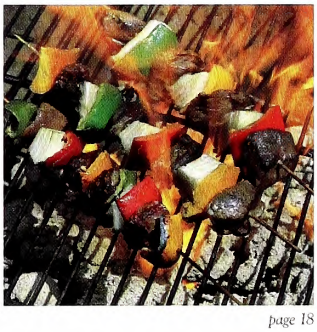
12 **The Best of Times for Black Bears** *written by Mark D. Jones*
photographed by William S. Lea
Populations are at modern highs thanks to education and careful management.

18 **Treat Venison Right** *written by T. Edward Nickens*
photographed by Jody Duggins
Process your own venison for flavorful, fork-tender meat.

24 **Reminiscence on Canvas** *captions by Bob Timberlake*
Painting wildlife has been Bob Timberlake's passion for three decades.



page 24



page 18

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Buffy Silverman* 28
Back Porch *by Greg Jenkins* 32
N.C. WILD Store 37

page 28

Cover *Changes in black bear management in the last 30 years have boosted bear populations across North Carolina. Photograph by William S. Lea.*

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $12, three years $30, lifetime $150. All foreign subscriptions are $28 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.

A herald petrel soars over the blue waters of the Gulf Stream. In addition to fishing trips, the Miss Hatteras *(facing page) is used to transport birders 40 miles off North Carolina's coast, where flocks of seldom-seen bird species gather.*

WRITTEN BY JAMIE CAMERON
PHOTOGRAPHED BY BRIAN PATTESON

The PERFECT birds

Famous for outstanding fishing, the blue waters of the Gulf Stream are also a birder's paradise.

THE EXCITED VOICE CAME OVER THE *MISS HATTERAS'* LOUDSPEAKER. "LOOKS LIKE WE'VE GOT A HERALD PETREL COMING TOWARDS THE BOAT AT 3 O'CLOCK," CAPT. SPURGEON STOWE SAID.

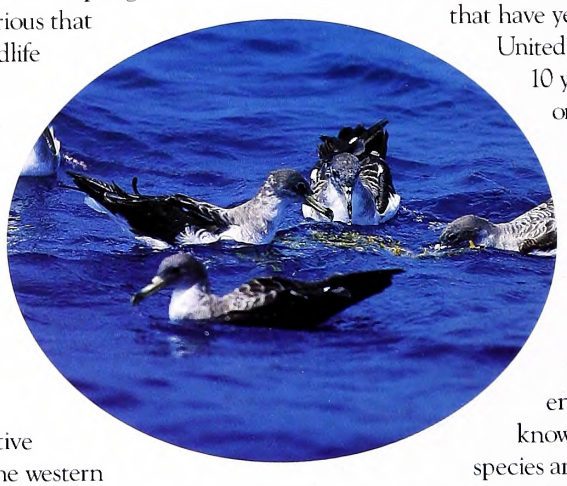
The news electrified the group of 40 bird-watchers who had been studying a feeding flock of Audubon's shearwaters and Wilson's storm petrels picking around a vast floating mat of sargassum seaweed. Stowe's frantic call from the wheelhouse of his 75-foot head boat was an alert to all hands that one of the most sought-after birds in North America was flying toward them midway down the starboard side.

The soot-colored bird with rapierlike wings approached the *Miss Hatteras*, making high, parabolic arcs—the flight style of the group of seabirds known as gadfly petrels. To the delight of the scrambling bird-watchers, the dark-morph herald petrel cruised across the bow and down the port side before quickly vanishing over the hazy horizon of the Gulf Stream. They had just observed one of the pelagic species that Stowe likes to call "the perfect birds."

Oceangoing species, from left: Northern fulmar, white-tailed tropicbird, greater shearwater, bridled tern, pomarine jaeger and black-legged kittiwake. Like songbirds at a feeder, a flock of Cory's shearwaters (right) forages on floating sargassum seaweed.

During the past decade, thousands of bird-watchers from across the United States and a number of foreign nations have flocked to Hatteras village on North Carolina's Outer Banks. They come for a chance to step aboard the *Miss Hatteras* and set sail for one of modern ornithology's final frontiers—the biologically rich waters of the Gulf Stream.

Some 25 species of deep-water seabirds have been found over the 80-degree waters of the Gulf Stream, 25 to 40 miles off the North Carolina coast. Most pelagic species are so mysterious that state and federal wildlife agencies have only recently begun to acknowledge their populations, movements and ecological niches in the waters off the East Coast.



Sea trips from Hatteras steam for some of the most consistently productive offshore waters in the western North Atlantic. The proximity of the warm Gulf Stream current and the edge of the continental shelf, as well as the influence of the cooler Labrador Current, makes Hatteras offshore waters a dynamic environment that attracts a remarkable diversity of seabirds throughout the year.

Shearwaters, storm petrels, jaegers, skuas, tropicbirds and four members of the prized gadfly petrel group make the Gulf Stream home for at least part of the year. These species cannot be observed by land-based watchers except on rare occasions, when powerful tropical storms suck up pelagic birds and, after making landfall, deposit them over inland waterways. Even the most powerful binoculars and telescopes fall short of the marine ecosystems where these seafaring species dwell. And because breeding sites are often on small, equatorial islets that the birds visit for just four or five months out of the year, the options for observing pelagic birds are quite limited.

But for veteran sea-birder and tour leader Brian Patteson, Gulf Stream expeditions provide the potential for seeing large numbers and many species, including some that have yet to occur in the United States. For the past 10 years, Patteson has organized pelagic trips for bird-watchers aboard the *Miss Hatteras*. With the help of Stowe and a dedicated team, trips like these have pushed the envelope of our knowledge of several species and their occurrence in North Carolina waters.

"Birders in North Carolina started taking boats out to sea 25 years ago," said Patteson. "But back then, the boats weren't fast enough to get out very far before you had to turn back or spend the night offshore. Now, with today's bigger, faster boats, we're finding that some birds that were thought to be scarce—such as the black-capped petrel and band-rumped storm petrel—are much more common once you get out over the 500-fathom curve."

Other recent discoveries during the last few seasons include the first Swinhoe's storm petrel in North American waters and the first

FIND OUT MORE ABOUT BIRD-WATCHING OPPORTUNITIES OFF THE NORTH CAROLINA COAST AT WWW.SEABIRDING.COM, OR WRITE BRIAN PATTESON, P.O. BOX 772, HATTERAS, NC 27943.

yellow-nosed albatross to be documented by photo off the coast of North Carolina. The rare Bermuda petrel has proven itself to be a regular visitor to local waters. The Bermuda is one of the most endangered seabirds in the world, with only 65 known breeding pairs nesting on a few rocks off the island for which they are named. Pelagic bird-watchers have observed at least a dozen Bermuda petrels from North Carolina-based boats over the last five years.

The crew keeps careful records of species, locations and water temperatures experienced on every offshore trip. The raw data fill an overstuffed filing cabinet in Patteson's Frisco home.

"One thing that keeps me—that keeps all of us—coming back to the Gulf Stream is the potential for observing something that no one has ever seen before in this country," Patteson said. "It's a big ocean out there, with endless possibilities. We've been shocked before, and I'm sure that, in the not-too-distant future, we'll be shocked again."

Patteson and Stowe occasionally attempt to raise the odds for new discoveries and "perfect birds" by turning the bow of the *Miss Hatteras* toward the Gulf Stream's eastern wall, up to 100 miles east of Hatteras. Other times, Patteson charters the 57-foot sportfisher *Country Girl*, captained by Allan Foreman out of Manteo, to explore the sea east of Oregon Inlet for cool-water rarities such as the white-faced storm petrel.

Winter voyages often reveal several species that are not present at any other time of year. Huge feeding flocks of Northern gannets can be found within a few miles of the beach. Further offshore, uncommon visitors such as great skuas, Northern fulmars and red phalaropes continue their seemingly endless search for food. When weather permits from December through February, seagoing bird-watchers often delight over sightings of razorbills, dovekies and Atlantic puffins.

Offshore bird trips during warm-weather months typically encounter nine to 13 species of pelagics. Most veteran bird-watchers come back to the dock with stories of at least one new check mark on their life lists. Newcomers can expect nearly every bird that materializes over the horizon to be a species they have never before seen.

Although birds are always the main focus, pelagic trips out of North Carolina are often enhanced with bonus sightings of the non-avian variety. Whales and dolphins frequent the Gulf Stream, and it is not unusual to see several species during a day at sea. Calm conditions allow for long-distance scanning through binoculars, which sometimes results in glimpses of enigmatic Cuvier's beaked whales, playful spotted dolphins or even a magnificent sperm whale. Two years ago, birders aboard the *Miss Hatteras* were awestruck by the appearance of a small pod of false killer whales. These highly active, toothed whales reach lengths of 20 feet and prey on fish as large as tunas and marlins. They are rarely recorded anywhere in the mid-Atlantic.

Sea turtles are also frequent sights. Loggerheads are most common, but the gargantuan leatherback is occasionally observed. Rays, marlin, flying fish, Portuguese man-of-war jellyfish, giant ocean sunfish and other piscatorial denizens of the deep help pick up the slack during the infrequent times when seabirds are few and far between.

In an age when much of the mystery has been taken out of the global environment, a trip to the magical blue waters of the Gulf Stream can make anything seem possible, including birds that are perfect. ⊠

Birders aboard the* Miss Hatteras *get a bonus sighting—an up-close look at a sperm whale.

Why we hunt

"I have a passion for the splendor of the great outdoors. There's always the rapture of being part of the circle of life."

A Hunt of My Own | by B.B. Gillen

Women who have never hunted often ask me why I enjoy hunting. And I try to put into words an experience that's difficult to describe. I enjoy tackling the challenges that hunting presents, and I enjoy watching nature. Best of all, I have a passion for the splendor of the great outdoors. There's always the rapture of being part of the circle of life.

When we hunt, our ability to camouflage ourselves becomes one of our most valuable tools. As a woman, this is a challenge because makers of outdoor clothing focus on the male population. My friends say I have a fetish for camouflage, which is true. While they visit the cosmetics and casual wear departments, I'll be in the sporting goods section getting excited over the newest pattern in camouflage or the newest gadget for hunting. Camouflage allows me to blend into the environment so that the game I am hunting will not be aware of my presence. I take great pride in being able to become part of the background.

While turkey hunting last spring, I was sitting against a tree waiting for a gobbler's arrival when a female brown-headed cowbird perched on the end of my shotgun barrel. That was a phenomenal experience. I didn't bag a turkey, but I enjoyed a close encounter with another feathered friend.

Then there's the excitement I experience on early morning hunts. When I watch a breathtaking sunrise and listen to nature wake up, I realize just how remarkable life is. I watch a spider spin its web, then catch its prey, as I too sit waiting for prey.

There's also the challenge of using game calls to lure an animal to just the right spot. Once I get my game in sight, that's when the adrenaline rush starts. My heart races. My breathing becomes irregular. Sometimes it is hard to hold my firearm still for a precise shot. I feel fortunate if the animal drops in my view after the shot. But there's also great satisfaction in following a blood trail and finding my prize at the end.

After the kill, it's always rewarding to see the accuracy of my shot. And there's more to do: aging the game, seeing what it fed on, dressing the animal and packaging the meat. Later comes the enjoyment of preparing and cooking the just-right recipe. Sitting down to enjoy that meal brings back memories of a great hunt that I can share with family and friends.

Posted in my office, I have a quote by Annie Oakley that I treasure: *"Any woman who does not thoroughly enjoy tramping across the country on a clear, frosty morning with a good gun and a pair of dogs does not know how to enjoy life. God intended women to be outside. They do not know what they are missing when they stay cooped up in the house with a novel."*

I am proud to say I can relate to that quote. Even though I don't hunt with dogs, I enjoy the wonderful sport of hunting. It involves being both a spectator and a participant in the cycle of life. And it's a heritage that I am fortunate to share with others, both on the job and off. Hunting is a blessing to me—a ritual that bestows goodness upon myself and others.

B.B. Gillen is a turkey and deer hunter and is the N.C. Wildlife Resources Commission's Outdoor Skills Coordinator.

We asked a cross-section of hunters what the sport means to them. This is what they had to say.

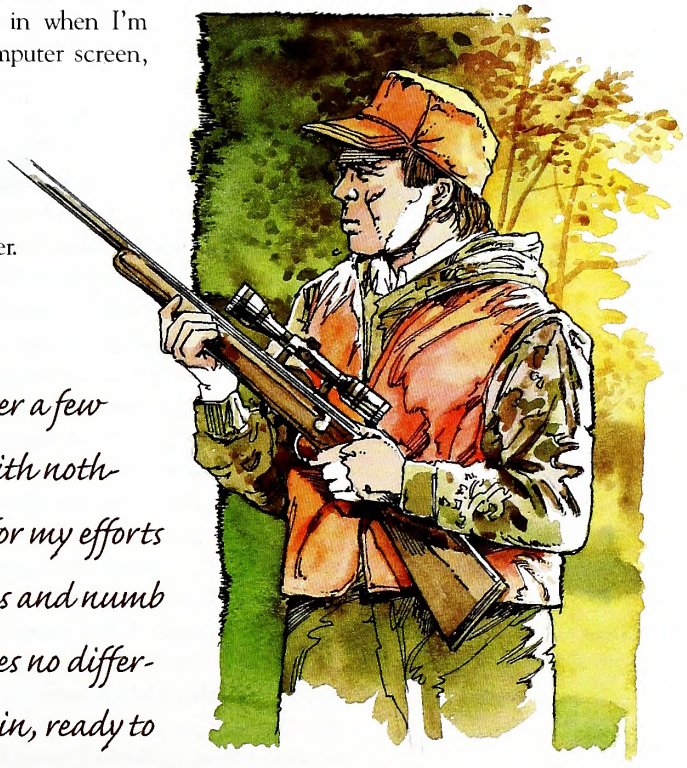
edited by Chris Powell | illustrated by Chris Armstrong

My Light | by David Hart

My wife's friend suffers from what psychologists call seasonal affective disorder, conveniently nicknamed SAD. It's a form of depression that sets in as autumn melts into winter, and the vibrant colors of summer and fall have surrendered to the constant grays of winter. The cure, I've heard, is a simple one: Stand in front of an artificial light for a few minutes each day until the first hint of green washes across the tops of the poplar trees, a sure sign that winter has passed.

I'm not sure what to think about a psychological disorder that uses a light bulb as a cure, but I certainly understand how weather can affect the psyche. I suffer from a similar disorder, but those cold, dreary winter days have the opposite effect on me. When I look out my office window and see a light rain falling on bare trees, I know the birds and other animals will be moving. Depression sets in when I'm stuck inside, staring at a computer screen, knowing that I should be out there.

I hunt for the same reason my wife's friend stands in front of an artificial light throughout the winter.



"I can come home after a few hours or a few days with nothing tangible to show for my efforts aside from wet clothes and numb fingers, but that makes no difference. I feel whole again, ready to resume my other roles."

When I grab my .270 or my shotgun and head for the woods, my mood changes. The worse the weather, the better I feel. I can come home after a few hours or a few days with nothing tangible to show for my efforts aside from wet clothes and numb fingers, but that makes no difference. I feel whole again, ready to resume my other roles.

I hunt because I have to. It's not a want; the urge to hunt, just to walk through the woods with a rifle or shotgun in hand, is too powerful a pull to resist. The mildew smell of damp oak leaves and the stink of marsh mud that bubbles up around my waders as I walk waist-deep through a swamp is my artificial light. The mere sight of a deer easing through a thicket or a gang of chickadees bouncing from limb to limb, unaware that I'm 10 feet from them, is exactly the cure for any form of depression I might suffer.

My light is all of the sights and sounds and feelings that come with a hunt. It is the uncontrollable shivering—even when I'm sweating from too many clothes on a mild autumn day—that sets in as I catch the first glimpse of antlers through a screen of saplings. It is the smiles on my friends' faces as we meet back at camp, eager to swap the latest news from the woods. It is the exhilarating feel of ice water that found a new hole in my chest waders on a bitter-cold morning in some duck marsh. I don't seek that kind of misery, but when it finds me, I welcome it. I'd rather be outside and suffer the effects of leaky waders than stand in front of an artificial light any day.

David Hart is a freelance writer from Rice, Va., and an occasional contributor to Wildlife in North Carolina.

Final Approach

by T. Edward Nickens

I ask the question over and over as I shiver in some frozen swamp, my shins battered from breaking ice in the dark. Or when I have spent three hours 20 feet high in an oak tree, letting mosquitoes feast on my wrists and neck so that I don't scratch and swat and send some phantom deer streaking for cover. I ask it again. A hundred times each winter, I ask myself why.

The question rarely comes up when I'm canoeing or bird-watching or wading a creek with my kids. I never question my sanity, much less my motives, when I'm camping or hiking or wasting perfectly good daylight hours trying to catch a fish.

So here is what I know:

"For a few brief moments I am part of the sinew and muscle and marrow of nature. Not an observer. Nor a student. Nor a passerby."

I like the taste of wild meat, and I like the fact that wild meat is relatively low in cholesterol and free of genetically altered hormones and antibiotics and who-knows-what-all, but that's not why I hunt.

I like the way a good gun comes up fast and fits so well that you don't really know you're pulling the trigger. I like the way a wet dog smells. And I like the view from a tree stand. From up there, I watch the raccoons slip out of the dead snags at dusk and commence their crepuscular romps. Where else can you get eyeball-to-eyeball with a flicker? Or look down on a squirrel, yawning in a patch of sun? But that's not why I hunt either.

It's not the sunrises. It's not the companionship of fine hunting pals (although misery does love company).

It is this: The ducks swing over the decoys, chattering to my fake birds like long-lost friends. I talk back, holding the duck call in one gloved hand and shotgun in the other. They are so close I see them cock their heads in flight, checking out the swamp and the decoys and the dead tree I lean against. I wouldn't move for all the money in the world. They head out over the swamp, and I am pleading on the duck call, begging them to give me another look. When they dip their wings to turn back I would swear I am having chest pains.

And then they disappear. How eight ducks can vanish overhead I'll never know. But they do, and as quickly as they are gone, they are back and closer than ever, and now I won't even look at them. I dip my head and let them pass over my hat brim. They are just ducks, I know, but they, too, are tiny pieces of Canadian prairie and Mississippi hardwoods, with a chaser of Chesapeake marshes besides. And now here they are, out front and overhead, and I have that feeling you get when you lean so far back in a chair that it begins to tip. The adrenaline comes like a flood that instantly washes over every fiber and cell of nerve and tissue all at once.

So they set their wings, and when it looks just right—don't ask me what that means—I am on my feet, and my shins no longer hurt, and the gun comes up so smoothly that I don't even know I'm pulling the trigger. For a few brief moments I am part of the sinew and muscle and marrow of nature. Not an observer. Nor a student. Nor a passerby. And there's only one way to know that. And that's why I hunt.

T. Edward Nickens of Wake County is a freelance writer and regular contributor to Wildlife in North Carolina.

Me Too | by Rachel Morgan

One solitary difference existed between me and my high school friends on the night of our senior prom. My friends worried about their hair, makeup and dates. I, on the other hand, wrestled with an explanation for why a mounted deer head would be present in the background of my prom photos. I am frequently forced to express to the world my exact motives for being a sportswoman.

My initial desire to hunt came about after an unforgettable discussion with my father, a lifelong hunter and fisherman. As he attempted to convince my brother to go deer hunting with him one weekend, I begged him to take me, and his response evoked my first true pang of feminist rage: "Well, Rachel, hunting isn't exactly a woman's sport." Both infuriated and appalled, I vowed at that moment to prove him wrong. After almost a year of arguing, I persuaded my father to take me deer hunting one Saturday morning. With the good Lord by our side, my dad actually got a buck that morning. And the thrill of our first successful hunt together gave me confidence that, with practice and dedication, I could find success in this outdoor sport.

Though my hunting endeavors began as a feminist challenge, my years in the woods have revealed to me a means of bonding with my father, connecting with wildlife and growing spiritually as an individual. I began to spend more time hunting with my father, and our time together connected us more deeply than words could describe. My motives for hunting became influenced by my desire to strengthen that relationship. Silently watching the sun rise over a field full of deer, we have forged bonds that reach back to his hunting experiences with his grandfather. After I shot my first buck, my father's face radiated pride as he told his hunting friends of my success. Making my father proud in the woods is the only way that I can fully give him thanks for introducing the blessings of nature into my life.

Hunting remains one of the few activities that allow me to explore myself and grow spiritually. I have found that I can solve any problem that arises in my life with a personal retreat into the woods. All anxieties, fears and pains melt away the instant I climb into my tree stand. Among the creatures of the wilderness, I delve into reflection and prayer. Wildlife encounters have been an endless source of spiritual healing and wisdom. Though a successful hunt is usually defined by the number of trophies hauled back home, I have found that any day in which I have immersed myself in the heart of the natural world and escaped the bustle of modern life can be considered a victory.

"After I shot my first buck, my father's face radiated pride as he told his hunting friends of my success."

As seasons pass, my enthusiasm for hunting continues to grow. It began as a simple challenge and has developed into one of the necessities in my life—a means of finding myself. Essentially, I have found within myself a void that can be filled only when I see the breathtaking view of a flock of doves flying across a misty field, when I feel adrenaline pumping through my veins as a gobbler comes into view or when I hear a buck quietly leave this world as he lies in the autumn leaves one final time.

While my life is constantly changing its course, the silent beckoning of the woods continually captivates me, forever leaving me longing for another moment in camouflage, a rifle slung over my shoulder.

Rachel Morgan of Forsyth County is an 18-year-old freshman at Wake Forest University.

Family Tradition

by Dan Kibler

When you turn off the main road, you drive down the old, dusty lane about 600 yards and make a big curve to the right. It's about 400 yards to the next big curve, a left that carries you toward the old homeplace among the oaks and pecan trees.

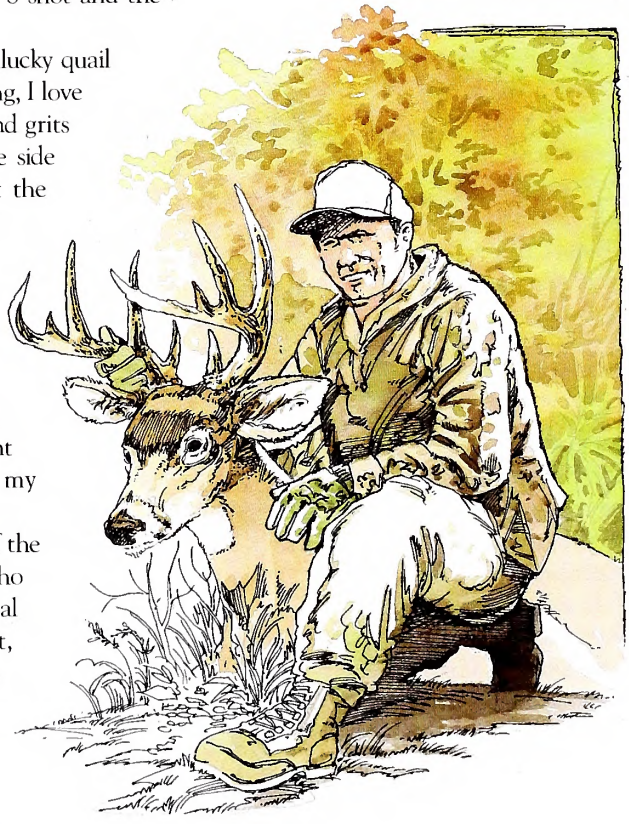
About 100 yards short of the second curve, on the left side of the road, there's a little high spot in the bank, now marked by an old pine stump and a well-worn deer trail. Walk 15 yards into the pines and stop.

Right there, 35 years ago, a brace of dogs locked down on a handful of bobwhites that were scattered in the briars. When they flushed, one of them was a little slower than the others, which was fine, because I was slower than the others—the adults who were with me. They had already gotten shots off at departing birds; I had rocked back on my heels at the explosion of wings. But the last bird finally came up, and so did my grandmother's little 20-gauge Foxx. I squeezed the front trigger and, somehow, the load of No. 8 shot and the bird collided.

There have been a few more unlucky quail over the ensuing years. For one thing, I love at least one meal a year of quail and grits with a slab of country ham on the side and a dribble of redeye gravy. But the deer haven't all been killed for the tenderloin, nor the turkeys for the strips of fried breast meat.

I do not hunt to eat. My wife can take care of our family's needs at the local grocery store. I do not hunt solely to kill, because I have had much enjoyment watching deer and never raising my rifle or bow.

Killing a bird or animal is part of the equation, but not all of it. People who deny that killing is the ultimate goal are kidding themselves; if it weren't, we'd all go into the woods with Kodaks instead of Remingtons.



"Most of all, hunting links me to that grandfather who first let me tag along behind the bird dogs."

There is the satisfaction of matching wits with a big-game animal on his home turf, trying to decide from the sign you find where it's likely to appear next, and what it will take to get within range at the right time. The actual shot is anticlimactic.

And I like sharing the experience with other people. I rarely hunt alone. There has to be someone with whom to share the day's events, to lament the sneeze that alerted the buck to your presence or the fox that slinked in and spooked the big gobbler.

Most of all, hunting links me to that grandfather who first let me tag along behind the bird dogs. He never understood my excitement for deer hunting, but he was there to slap me on the back and help me drag to the truck the forkhorn that was the first deer killed on the family farm. Hunting extends the connection from my father to his own grandfather, who would never let him shoot a rabbit in its bed, holding him back until the beagles had flushed it so it had a sporting chance.

This fall, it will link my 11-year-old son even closer to the gray-haired man who taught me to hunt, and at whose wing-shooting I marveled when he once tripled in a dove field. It will be a privilege to have him sitting in the platform stand where the three shooting lanes intersect, spotting that first deer and instructing my son on bringing the gun to his shoulder, taking careful aim and squeezing the trigger. My eyes tear up just thinking about it.

I can imagine no better way to pay my father back. Perhaps when I hear the shot and come running, I will find them hugging each other. And I will remember what it was like at age 16 to top the little rise and find the six-point buck, ahead on the trail, graveyard dead. And I will remember his words, "I'm proud of you, pal," and my response, "I love you, Dad," and then, I will really be able to explain why it is that I hunt.

Dan Kibler of Forsyth County is a reporter for the Winston-Salem Journal *and a regular contributor to* Wildlife in North Carolina.

The Arrowhead | by Chris Powell

Dad and I were shooting the breeze one late morning, following a hunt on the family farm, when he looked down and picked up an arrowhead. It was made from a grayish, almost-white rock. And surprisingly, somewhat of an edge could still be felt, despite its having been buried in the field where the soil has been turned for a few hundred years.

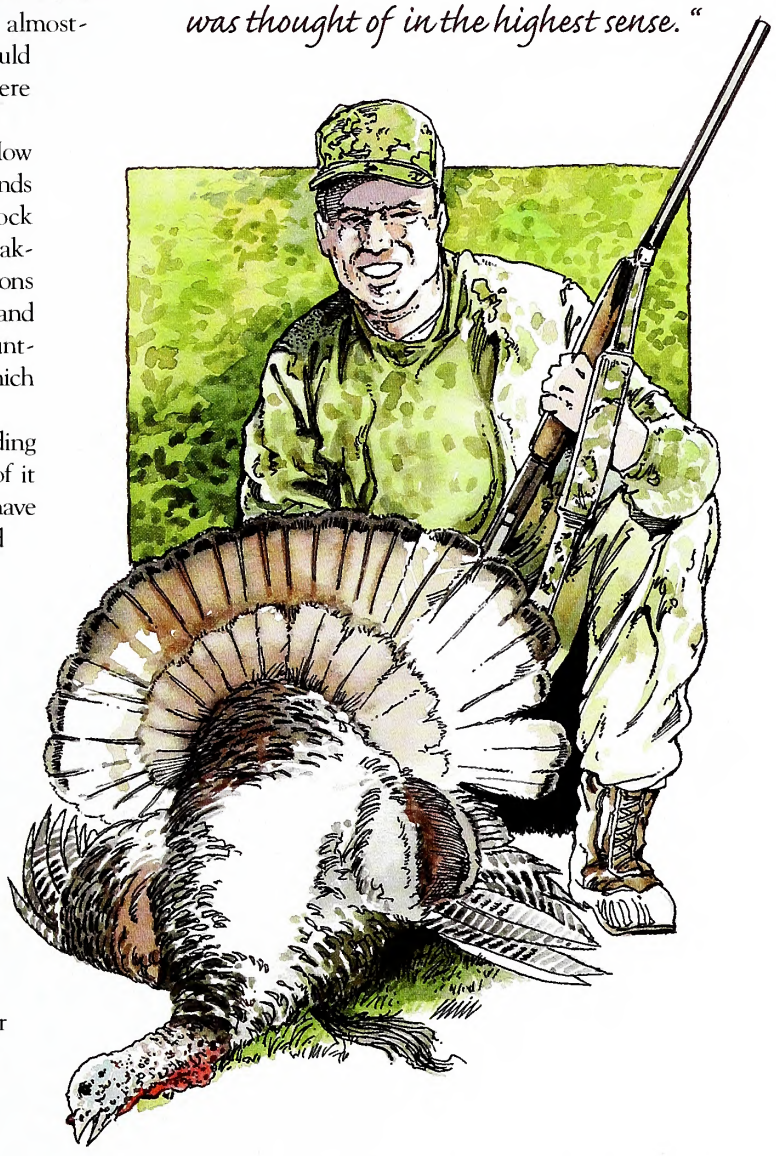
The importance of the find was not lost on me. How amazing to hold what had once probably been in the hands of a Tuscarora craftsman so long ago. I could visualize rock hitting rock, and the hunting implement painstakingly taking shape one chip at a time. It was proof that many moons prior to that morning, hunters sought game on the same land they likely considered as important as we do today. The hunting point was also a tangible link to a way of life from which Dad and I were not completely removed.

I couldn't bear the possibility of that arrowhead ending up in the bottom of a desk drawer. I made a necklace of it using natural twine, just as an American Indian may have once used to fashion the head to an arrow shaft. Good fortune afield is one reason. Moreover, the arrowhead is worn as a silent tribute to a people I admire for their understanding of the world and how they fit into it.

It is comforting to think that the game the arrowhead may have brought down was thought of in the highest sense. The taking of a life and the consumption of flesh were no small matters. Game that provided sustenance typically received the loftiest of honors in tribal cultures. Hunted animals were painted, sometimes danced to and used in entirety.

The last remnants of those old customs can still be seen. Go to any hunt club the night before Opening Day of deer season, and you can almost hear the drum beat in the excitement and anticipation of what the morning might bring. Visit a hunter's home, such as mine, and you will likely see a white-tailed buck displayed prominently over a fireplace, or a gobbler's fan and beard or a duck mount. Paintings of wildlife scenes usually adorn their walls, only they're done on canvas with synthetic paints rather than on animal skins with crushed berries.

"It is comforting to think that the game the arrowhead may have brought down was thought of in the highest sense."



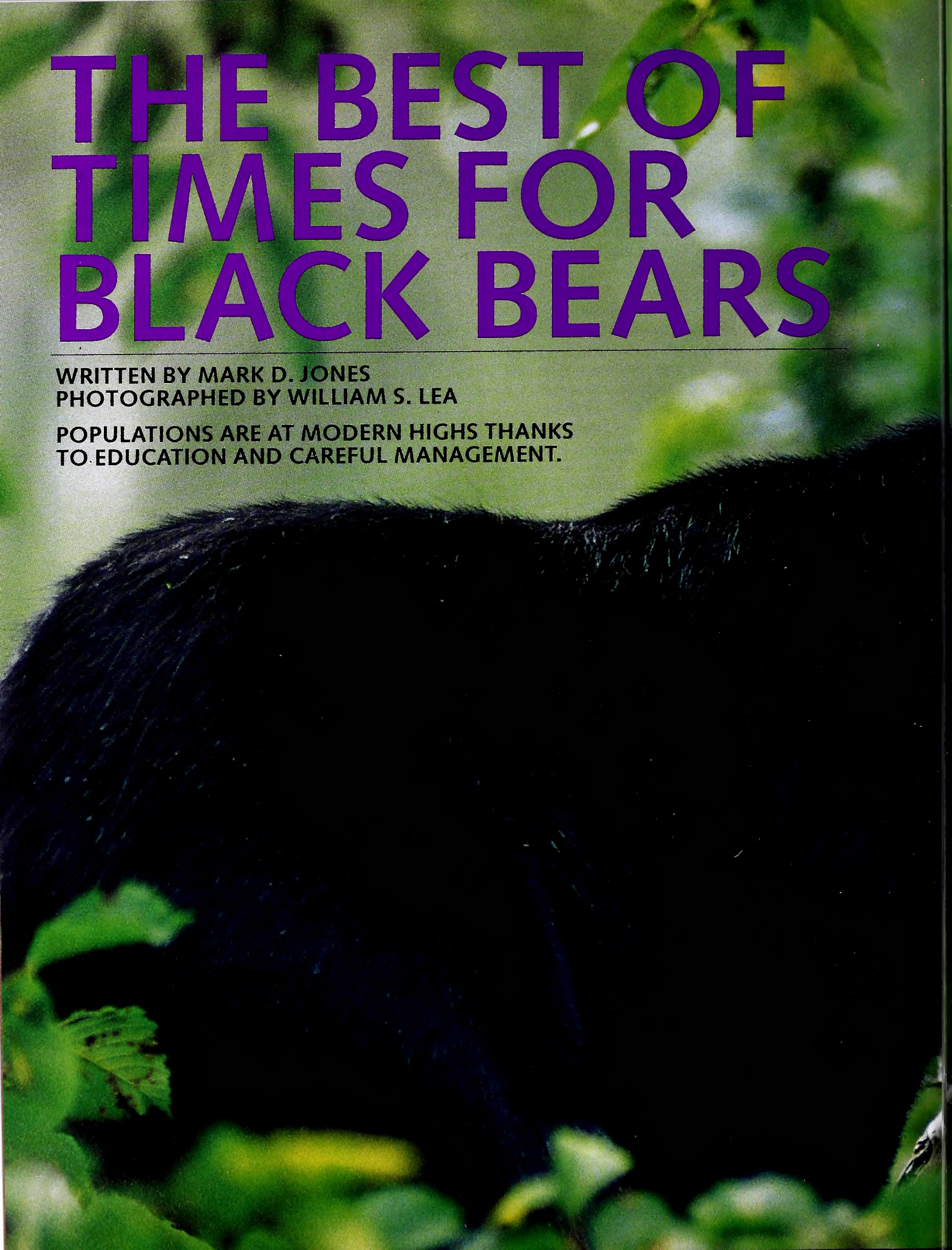
My reverence for the wild animal is almost envy. To live and die free and wild is an existence I admire. The taking of game has also helped me make peace with the truth of life. It is an important reminder that a beginning becomes an end, that the process includes myself and that it is the way it should be.

Chris Powell is managing editor of Wildlife in North Carolina. *E-mail comments on this series to margaret.martin@ncwildlife.org.*

THE BEST OF TIMES FOR BLACK BEARS

WRITTEN BY MARK D. JONES
PHOTOGRAPHED BY WILLIAM S. LEA

POPULATIONS ARE AT MODERN HIGHS THANKS TO EDUCATION AND CAREFUL MANAGEMENT.



The black bear is North Carolina's largest land mammal and a species of contradictions. It is one of the most feared, loved and misunderstood animals in North America. From Winnie the Pooh to marauding killer, bear species generate a variety of mental images. While many people perceive black bears, the only bear species found in the eastern United States, as either cute and cuddly or dangerous and aggressive, the truth lies somewhere in between. Classified in the order Carnivore, black bears are actually opportunistic omnivores capable of eating everything from ants and berries to large mammals and human garbage.

Black bears are also shy and secretive creatures rarely sighted unless accustomed to human food, and they rarely attack people. Statistics show that bees, floods and lightning are more likely to harm a person than is a bear, even in areas with high bear densities. However, this creature has killed at least 45 people in North America—mostly in Canada and Alaska—and deserves the utmost respect.

As many North Carolinians can attest, black bear populations have increased in recent years. Thousands of bear-human interactions occur in the state each year without harm to animal or person. Most conflicts in North Carolina involve bears damaging crops or destroying bird feeders and garbage cans.

BEARS OVER TIME

In pre-colonial times, black bears thrived in each of what would become the lower 48 states. They were particularly abundant in the deciduous forests of the East Coast, including all of North Carolina. Following the example of Indian tribes, early colonists relied on bears for a variety of products. The meat and fat were eaten or used to season foods, and the oil from bear fat was used to treat aches and pains. Bear hides were prized for hats and clothing.

The significance of bear hunting was first recorded in 1709, when explorer John Lawson noted, "Bear-Hunting is a great sport in America, both with the English and the Indians." Another explorer, William Bartram, visited the North Carolina mountains in 1774 and wrote, "The bears are yet too numerous." Colonial hunting methods often employed fire to flush bears from dense cover.

As early as the 1700s, North Carolinians developed well-known breeds of hounds specifically for the purpose of pursuing black bears. The official state dog is a bear hound called the Plott. Named after a German family who came to America in 1750, the breed represents a regional effort to produce prime bear-hunting dogs. Good bear dogs were a source of pride and confidence because they helped ensure that a family would have food and clothing for the winter.

Like mountain lions and gray wolves, black bears were perceived as threats to humans and their livestock; all three species were intensely hunted by early settlers. Unregulated killing was coupled

with severe habitat degradation as settlers exploited forests without regard to the needs of wildlife. As a result, bear populations suffered. By the early 1900s, black bears were extirpated from the Piedmont and restricted to the most remote areas of the mountains and coast.

In 1927, the first bear-hunting season was established statewide, from Oct. 1 through Jan. 15, with no bag limit. Season changes occurred by region over the next few years. In 1936, the first bag limit was established at two bears. With the creation of the N.C. Wildlife Resources Commission in 1947, the bear bag limit was set at one animal per hunter per year.

Not until 1969 did the commission formally monitor black bear populations. The following year, the commission initiated what many consider to be the wisest move in the history of black bear management. With support from bear-hunting groups, a sanctuary system was established, prohibiting the hunting of bears in 28 tracts. The sanctuary concept takes advantage of the small home ranges of female bears. Protected from harvest, sanctuary females produce offspring that populate surrounding areas over time.

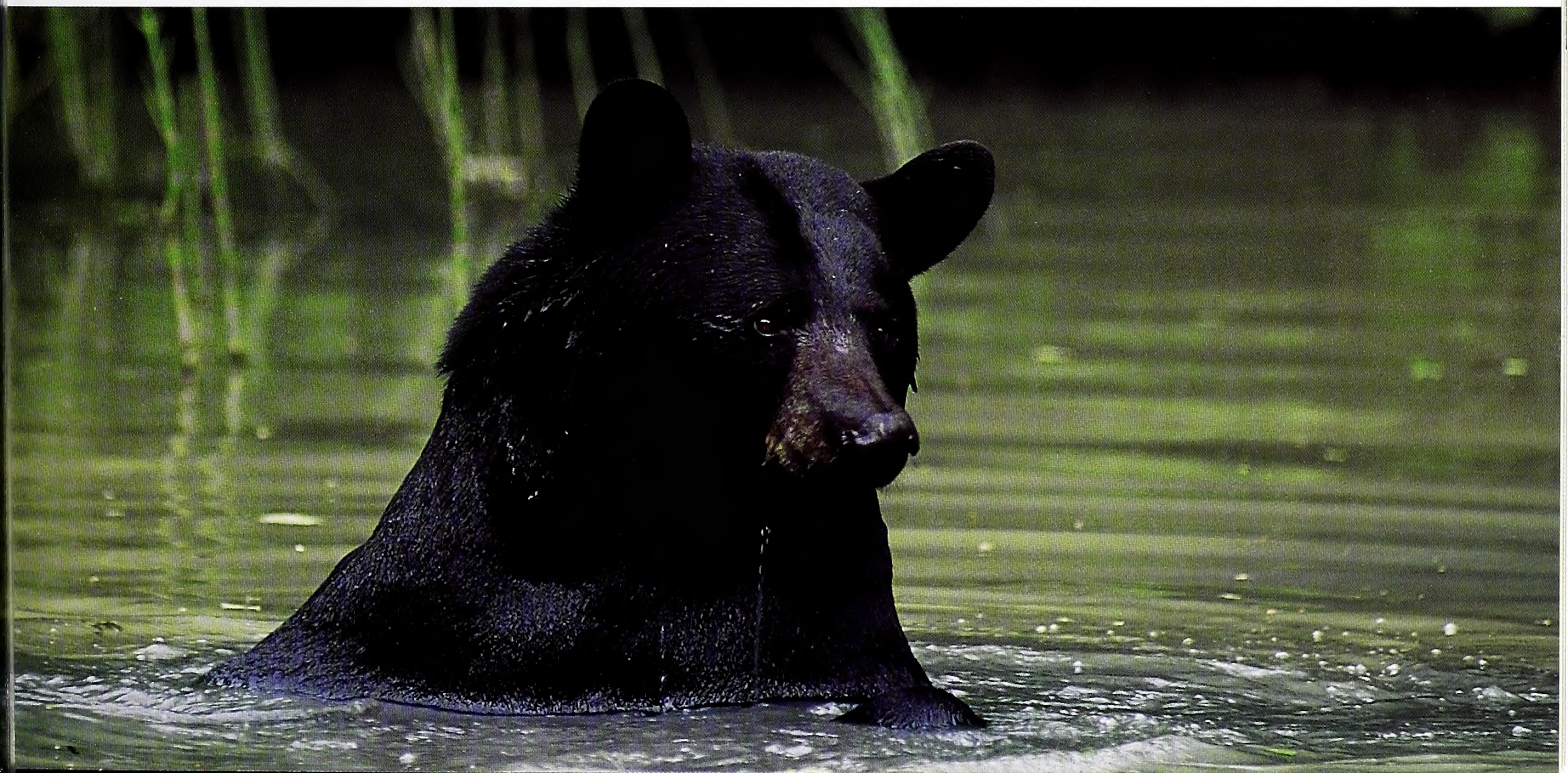
Currently, there are 365,000 acres of commission-designated sanctuary in the state. On an additional 1.6 million acres of de facto sanctuary, bear hunting is not allowed by the landowner. Prominent de facto areas include the Great Smoky Mountains National Park, national wildlife refuges, state parks and many municipal watersheds. Sanctuary has proven to be the key to black bear numbers. As we enter the 21st century, both black bear populations and hunting interest are at a high in North Carolina.

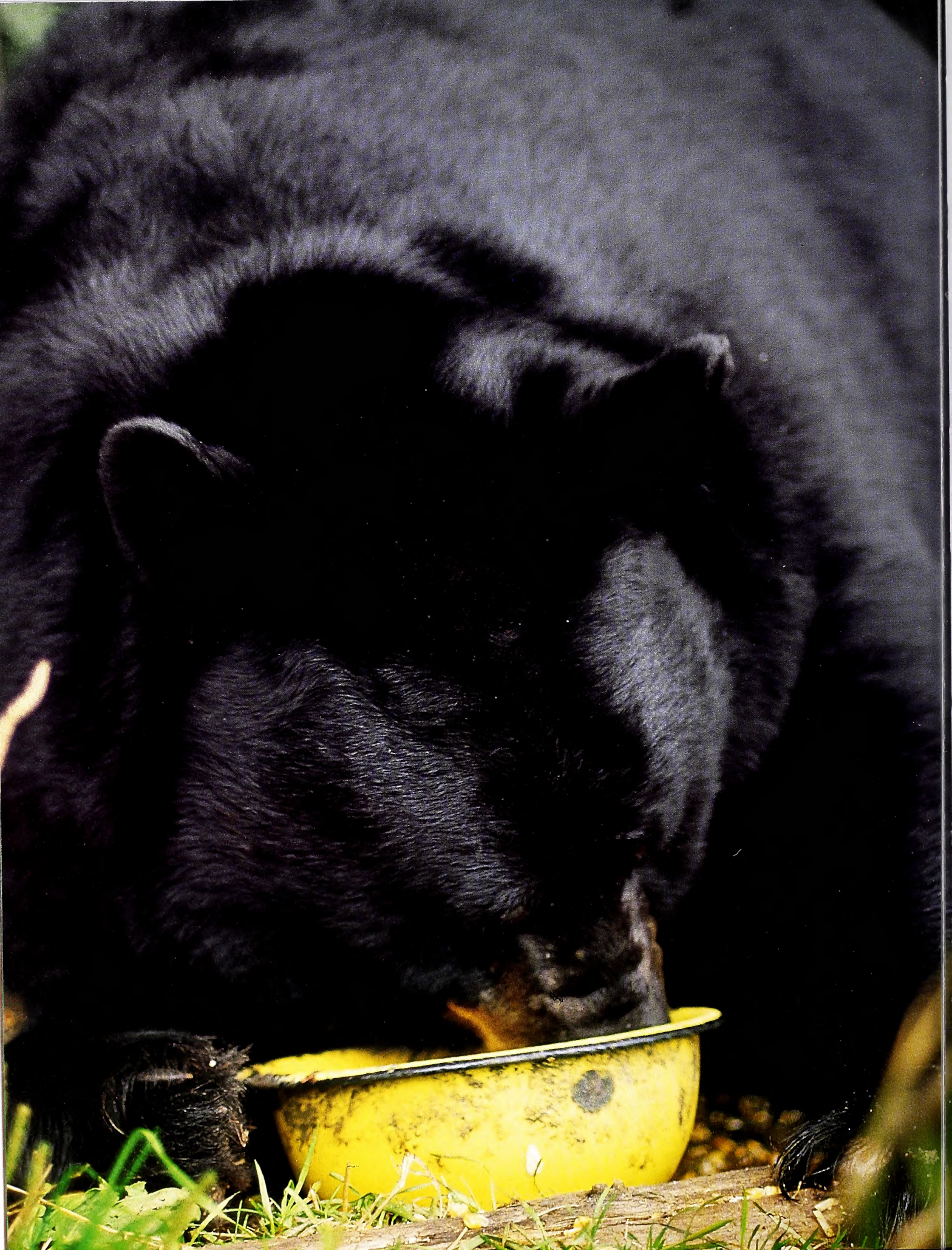
SPECIES RECOVERY AND EXPANSION

Black bear range and numbers have expanded rapidly during the past 30 years. These increases were not achieved by the sort of stocking efforts that boosted wild turkey and white-tailed deer populations. The expansion may be traced to changing public attitudes about bears, assertive legislation and enforcement, better management by wildlife agencies, the adaptable nature of bears and the ability of bears to coexist peacefully with people in most circumstances. The increase in range has occurred naturally as bears have moved into suitable but previously unoccupied habitat. Reproducing female black bears occupy approximately 22,183 square miles (45.5 percent of the state's total land area) and are found primarily in the coastal and mountain regions. Surprisingly, eastern counties near the coast comprise 66 percent of the state's bear range, with the remainder in the mountains. Bears have not returned to most areas of the Piedmont because of high human density and degraded habitat. However, residents in some of the more remote areas in the northern Piedmont are reporting more bear sightings.

Field studies in North Carolina have identified densities ranging from 1.38 to more than 3.5 bears per square mile. Commission staff spend thousands of hours each year collecting data from black bears killed by hunters and automobiles. Age and reproductive

Preventing black bears from looting trash is crucial to the long-term survival of the species. When bears are allowed to become habituated to people and lose their fear of humans, bear-human interactions frequently result in the death of a bear. Bears left to thrive in their own habitat will continue to produce healthy cubs such as the ones pictured here.





data are used to estimate populations: around 7,000 and 4,000 bears in the coastal and mountain regions, respectively.

There are more bears in North Carolina today than at any other time since colonists settled the state.

OUTLOOK FOR THE FUTURE

With this abundance comes the potential for monumental conflicts between bears and people. The biggest threat facing black bears in North Carolina is that populations in some areas may be exceeding what is known as cultural carrying capacity—the population level of a species that the public will accept without demands for reductions. White-tailed deer reached this level years ago in many areas of the United States.

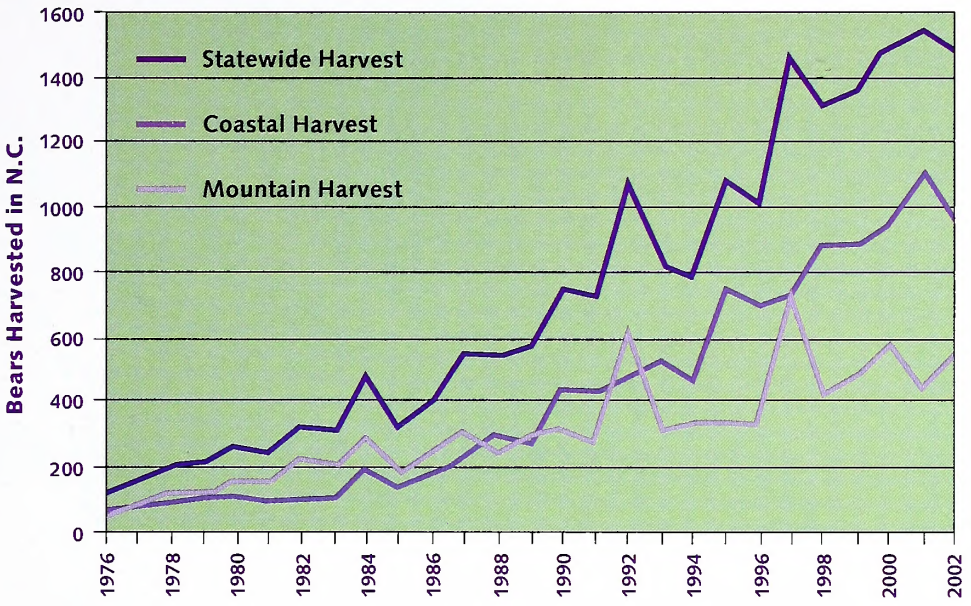
Unfortunately, bears are seen as nuisances in some areas of the state. Complaints from citizens, which are tracked by biologists, have risen to all-time highs in recent years. Most of these complaints flow from areas where towns and cities have encroached on habitats traditionally occupied by bears. In western North Carolina, complaint levels are highest in towns such as Asheville, Black Mountain, Cashiers and Highlands. Coastal farmers also experience some damage on crops bears favor, especially corn, peanuts, soybeans and wheat.

North Carolina manages bear populations within seven bear management units and operates five regional hunting season structures. Study data show that the harvest has increased dramatically in the coastal region during the last 10 years, to a high of 1,107 bears in 2001. Annual mountain harvests fluctuate depending on mast levels and have ranged from 301 to 726 since 1993. Males account for 60 to 65 percent of the mountain harvest; coastal harvest typically runs 50 to 60 percent males.

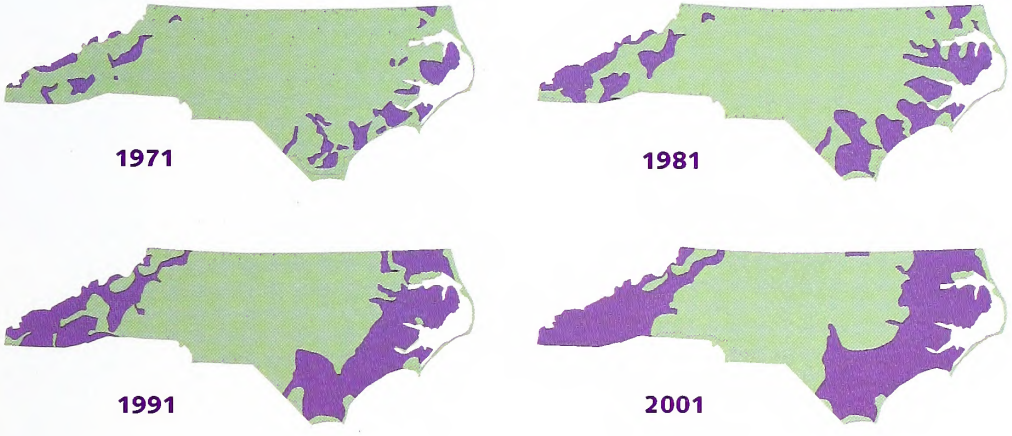
In recent years, North Carolina has gained a reputation for producing large black bears; many exceed 600 pounds in the coastal region. In 1998, a hunter harvested a black bear weighing 880 pounds, the heaviest black bear ever recorded by a United States or Canadian wildlife agency. For bear hunters and those interested in viewing these magnificent animals, opportunities are greater now than at any other time in modern history.

Omnivorous and opportunistic, black bears plunder pet food if given a chance.

BLACK BEAR HARVEST IN NORTH CAROLINA



BLACK BEAR RANGE EXPANSION IN NORTH CAROLINA



Source: N.C. Wildlife Resources Commission

The steady increase in black bear harvests since the mid-1970s correlates with the expanded range of the black bear in eastern and western North Carolina.

Hunting keeps bear populations at acceptable levels in most areas. However, as people continue to move into bear habitat and build homes, conflicts with bears will arise. Citizens can learn ways to live with the species and can help avoid problems by ensuring that bears do not have access to human garbage, bird seed, dog food or other attractants. Feeding bears, intentionally or otherwise, often results in a bear's untimely death because the animal loses its fear of people. Wildlife biologists and enforcement officers respond to numerous complaints each year from citizens wanting bears removed from neighborhoods where they have become habituated to human food. However, bears are rarely moved; officials try to avoid transferring a problem from one area to another.

These truly are the best of times for black bears in our state. North Carolina has proven that it can maintain a strong hunting tradition and high densities of bears. The future of bears depends on managing conflicts between bears and people to keep these majestic creatures wild. ⊠

Mark D. Jones is a black bear biologist with the N.C. Wildlife Resources Commission.

Treat Venison Right

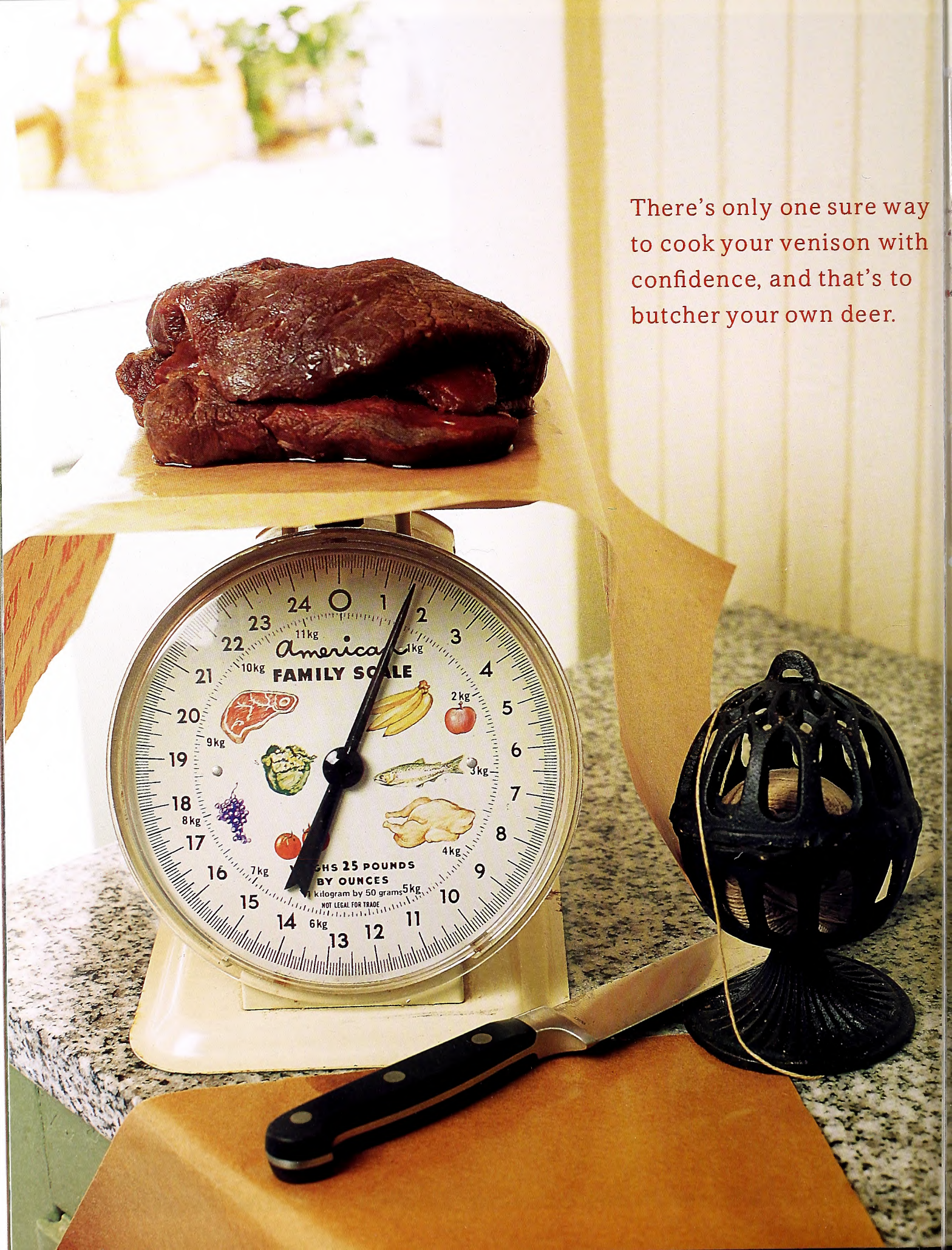
Process your own venison for flavorful, fork-tender meat.

You scouted it for weeks, patterned its movements at dusk and dawn, glassed it from afar, and then, this very morning, you killed it cleanly with a single textbook shot behind the shoulder. You quickly field-dressed it, hauled it into the boot of the SUV, and now you are the worn-out owner of one dead deer.

You're also faced with the prospect of turning 130 pounds of white-tailed deer into pan-sized portions. Maybe even feeling lost between the end of all those deer-hunting magazine articles and the table of contents in the typical wild-game cookbook. That's the gap I'll try to fill.

For starters, I'll be honest: There is nothing easy about processing a white-tailed deer. It takes time and effort and not a little bit of wanting to do it right, because there is an easy way to get around all this work. You simply turn your deer into one of the many deer-processing shops, which will then turn it into nicely wrapped bundles.

Written By T. Edward Nickens Photographed by Jody Duggins


There's only one sure way to cook your venison with confidence, and that's to butcher your own deer.
FAMILY SCALE
BY OUNCES
NOT LEGAL FOR TRADE

Or perhaps you believe as I do that the way to end up with the best-tasting, most tender venison possible is to age and butcher the deer yourself. When I pull a plastic baggie from the freezer, I don't have to guess what's inside. In the vast majority of cases I killed the animal, cleaned it, skinned it, butchered it, fretted over each fleck of fat and sinew, ground the burger and labeled the bag myself. If it's gamey, don't blame the animal. Blame me.

Once you have a deer in your possession, you have a couple of choices to make that can dramatically affect the taste of venison. First, do you age the deer or process it immediately? And second, do you butcher the carcass yourself?

Aging

Whether or not to age a deer—to hang it in a clean, cool environment for a number of days—is a contested notion. One of the great game cooks of modern times, A.J. McClane, figured the aging of game to be a holdover from the centuries before modern refrigeration. McClane's seminal book on wild-game cooking, *A Taste of the Wild* (Truman Talley Books, 1991), is among the most inspiring on my cookbook shelf. But I couldn't disagree more about aging game.

Aging helps to develop the intense, complex flavors that set wild meat apart. Just about any animal will benefit from the process, with the exception—and this I've learned the hard way—of squirrel. French cooks once suggested that pheasants be hung by the tail and judged fit for the table only when they fell by their own weight, about three weeks later. That's a bit much for me, but I do age ducks, entrails intact, for a week in the vegetable crisper of the refrigerator. My wife and children know to look elsewhere for the apples during duck season. (My mother-in-law did not, but that is another story.)

Aging also breaks down tough tissues and can turn older animals into fare fit for the grill. The aging process doesn't begin until after rigor mortis has left a carcass, some 10 to 24 hours after the animal expires. Naturally occurring enzymes weaken collagen, the connective tissue that binds muscle fiber. The best game cooks suggest that the optimum temperature for aging big game is between 35 and 45 degrees, held nearly constant, for up to 10 days. According to Eileen Clarke and Sil Strung (their book *The Art of Wild Game Cooking* [Voyageur Press, 1995] is the best on the topic), you can safely age a deer for two weeks, perhaps more, if held at a fairly constant temperature of 35 to 40 degrees.

The process is fairly straightforward: Hang the carcass wherever you can count on the optimum temperature. If at all practical, keep the hide on the animal, for bacterial growth typically will occur on exposed tissues. Skinning an animal before aging will also result in loss of meat when you must trim away the dried outer crust of exposed tissue. The secret is to check carefully for the first signs of mold on a hung carcass—checking as frequently as three times a day in warmer climes—and butcher the deer immediately at the first tinge of mold.

I've aged deer when outside daytime temperatures went to 70 degrees, but cool nights kept a shady garage well below 60. My hunting buddy and I fretted over those carcasses. We kept the garage doors open at night and shut tight during the day. During the warmest periods, we placed a bag of ice inside the animals' chest cavities. Four days later we butchered the deer, and the flesh was perfect.

Of course, a north-facing garage (and an understanding spouse) comes in handy when it's time to hang a deer, but there's a bigger challenge for Tar Heel hunters: hot weather. For much, if not most, of the deer season, outside temperatures are too warm, or too inconsistently cool, to properly age an entire hung deer carcass.

Of the six deer my hunting partner and I killed last year, half were shot when the outside daytime temperatures were warm enough to fish without a shirt on. Hauling these deer up in the garage rafters for a week was out of the question. Instead, we aged the deer in coolers. It was a simple process: In the bottom of large marine coolers we layered bags of ice, a piece of plywood and a plastic garbage bag. We skinned and quartered the field-dressed carcasses and placed the quarters on top of the plastic. Very carefully we added a bit more ice, taking pains to keep some space between the meat and the ice. We monitored the coolers over the next few days, draining out melted ice water and adding ice as necessary. After five days, we butchered the deer. We lost a little bit of meat, mostly due to the fact that we had to skin the animals first, exposing more surface area to the drying effects of air. But today I can't tell the difference between cuts from those deer and meat from deer killed two months later, which hung for six chilly days in the mid-40s.

Butchering

Aging a deer is the easy part. Butchering a deer is the most difficult. There is nothing fun about rendering the carcass of a big game animal into individual meal-sized packets, and that's why so many hunters turn their deer over to commercial butchers on their way home from the field. And that, I maintain, is why so many friends of hunters think that venison is tough, gamey and fit for stew at best.

Not long ago, I cooked venison steaks that a friend had given me. They were packaged in butcher paper, professionally wrapped, neat as a pin. My 5-year-old daughter, accustomed to cutting thinly sliced portions of venison with her Tweety Bird fork, turned her nose up at the first bite. "Don't like it!" she wailed. "Too chewy! Too sour!" What she meant was: "These steaks were cut with a saw, Daddy, so bone meal was spread through the meat, which makes it taste strong, especially after marinating in the freezer for a few months, wrapped only in plastic film and butcher paper." Or something like that.

There's only one sure way to cook your venison with confidence, and that's to butcher your own deer. Set up a couple of sturdy tables. Quarter the deer, then carefully separate legs from the quarters and then separate the leg joints. Use a knife, not a saw. Now bone out the entire carcass. Cut out entire muscle groups when possible. Assiduously remove as much fat, gristle, tendon, sinew and fascia "silverskin" as you can. Run the flat side of a paring knife under the silverskin and strip it away. This step alone ensures that deer processed at home ranks superior to the carcass turned over to the local deer butcher. Fat and connective tissue in venison are the first parts to turn rancid; sour fat will turn even the finest cut of meat into a bonus meal for the house dog. And the silverskin can turn tough as tendons.

Now your fresh, boneless, carefully trimmed meat is ready for packaging. The best way to freeze it is in plastic baggies. In goes the meat, then enough water to cover it. I seal up the baggie while forcing a bit of water through the seal. The vacuum created blunts freezer-burn for a good 12 months.

There. The freezer is full and the hard work is done. You've crossed that gap between the deer-hunting how-tos and those mouth-watering recipes you stuffed in a file folder. And there's no better way to congratulate yourself than to feast on the fruits of your labors. I have a few ideas about that in the following pages.

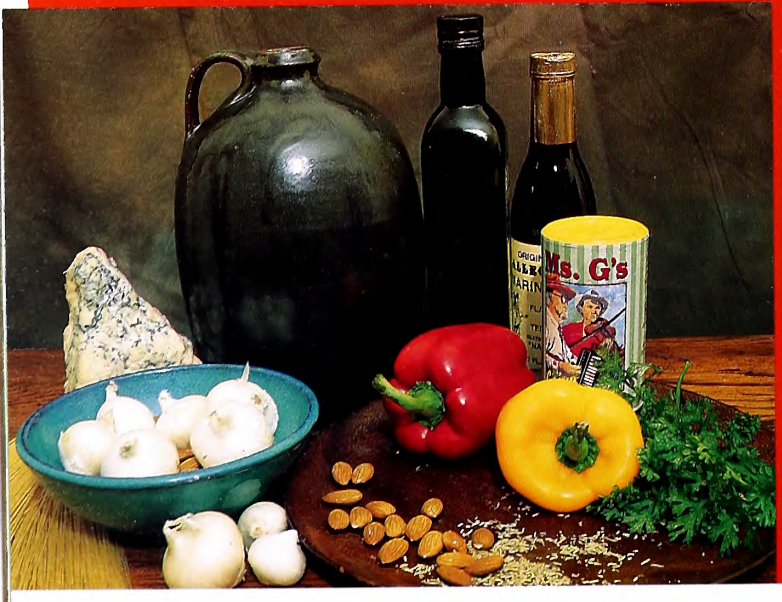
Four Venison Recipes You Must Master

Superfast Asian Venison Stir-Fry

One pan means it's quick to prepare, quick to clean. A great dish at home or in camp.

- 12 oz. venison steak, cut into stir-fry slices
- 2 tsp. toasted sesame oil
- 1 bunch sliced green onions
- 1 12-oz. package broccoli slaw mix
- 2 packages beef-flavored ramen noodles
- 1 1/2 cups water
- 2 tsp. Chinese five-spice powder
- 2 tbsp. soy or teriyaki sauce

Stir-fry venison in 1 teaspoon sesame oil for one minute. Add onions and stir-fry one more minute. Spoon mixture onto a plate. Add one teaspoon sesame oil and stir-fry broccoli slaw until tender-crisp. Spoon onto same plate as steak and onions. Add water to pan and bring to a boil. Add both packages of ramen noodles but only one package of noodle seasoning. Add five-spice powder. Stir to break up noodles and continue stirring until all water is absorbed. Add the venison, onions and slaw. Add soy or teriyaki sauce, and stir-fry until heated. Serves two very hungry folks.



Black-and-Blue Cheese Steaks

This one comes from *Game on the Grill: The Art of Barbecuing, Grilling, and Smoking Wild Game*, by Eileen Clarke (Voyageur Press, 2001). It's a must-have.

- 6 oz. blue cheese, crumbled
- 4 tbsp. butter, softened
- 1/4 cup smokehouse almonds, chopped
- 1 1/2 lb. venison, cut into 2 steaks, 1-1 1/2 inches thick
- 1/2 tsp. salt
- 1/2 tsp. pepper

Stir the cheese and butter to blend, then fold in almonds. Cover and refrigerate up to two days ahead. Season steaks with salt and pepper; grill rare to medium rare. Top with blue cheese and almond mixture. Makes two generous servings.

Text copyright Eileen Clarke, reprinted with permission of the publisher, Voyageur Press, Inc., Stillwater, Minn. (www.voyageurpress.com).

Venison Étouffée (Smothered Venison)

I learned this recipe while spending several days with Cajun hunters in Louisiana's Atchafalaya Basin. This method of preparing venison remains my favorite. Adjust the amounts of ingredients and cooking time to your taste; taste often. That won't be a burden, I promise.

- 3 lbs. venison, cut into bite-sized pieces
- 6 tbsp. (or more) Cajun seasoning
  My favorite is Ms. G's, available at Mulate's restaurant in Louisiana, 1-800-422-2586.
- 2 tbsp. butter
- 4 medium onions, sliced
- 2 large bell peppers, sliced
- 2 cups flour
- 3/4 cup vegetable oil, or enough to fill skillet or Dutch oven to 1/4-inch depth

Season the venison with the Cajun seasoning and let sit in the refrigerator overnight. Melt the butter in a skillet and

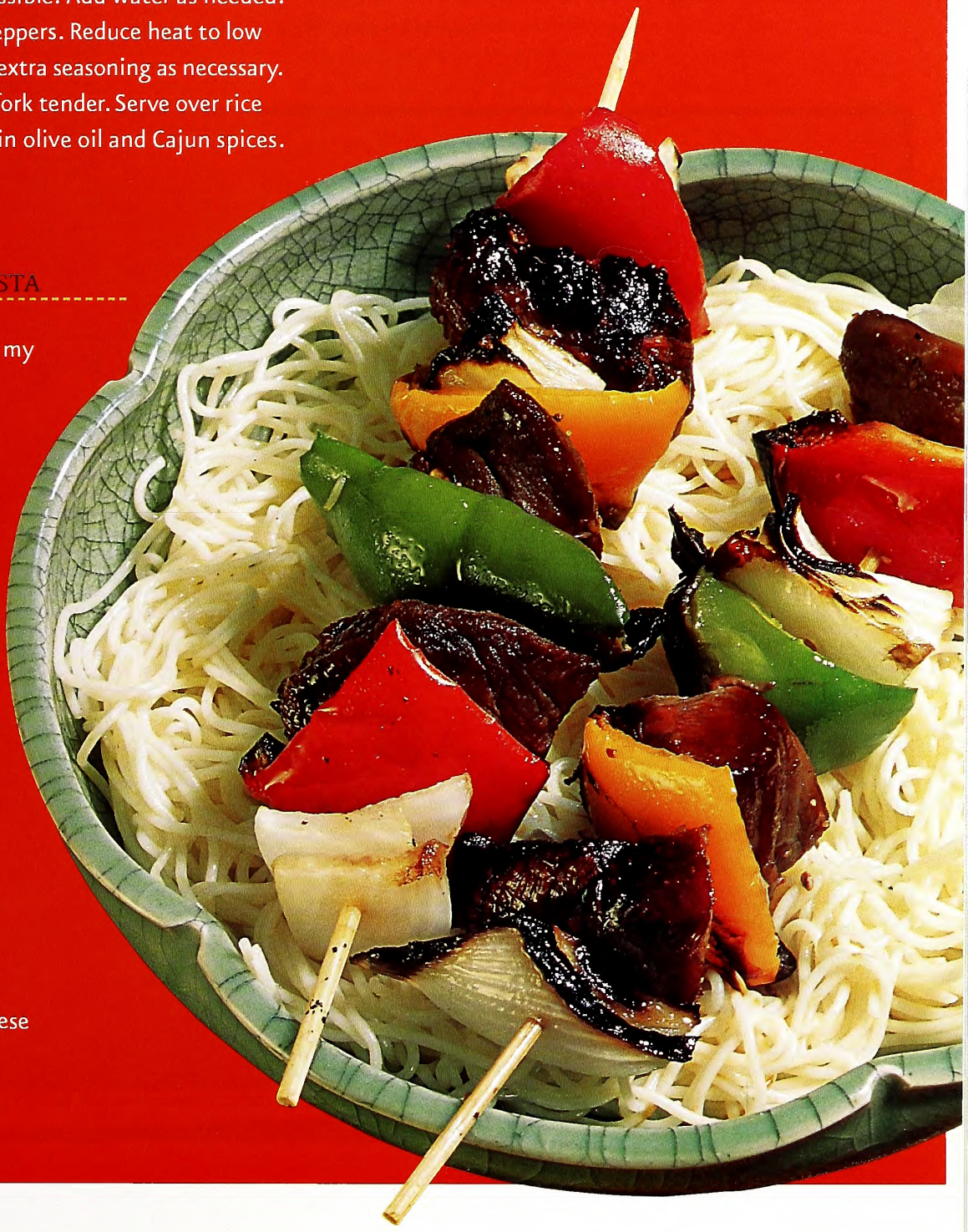
slowly sauté the onions until they turn brown and caramelize. Remove. Sauté bell pepper for a few minutes, then mix with onions. Coat one-half the venison cubes with flour. Heat the oil in a Dutch oven or large covered cast-iron skillet over medium high heat. Brown all the venison, taking care to scrape the brown bits from the bottom of the pot frequently with a wooden spoon. The browned bits yield gravy, so scrape as much as possible. Add water as needed. Add the sautéed onions and peppers. Reduce heat to low and simmer, adding water and extra seasoning as necessary. Cook another few hours until fork tender. Serve over rice with a side of squash sautéed in olive oil and Cajun spices. Serves six.

Skewered Venison Pasta

Can't miss, can't beat it. This is my fall-back venison recipe, and it never fails me.

- 1 lb. venison backstrap (loin), cut into 1½-inch cubes
- 8 oz. soy-based marinade, such as Allegro's
- 1 medium onion, cut into wedges
- 1 medium green bell pepper, diced
- 1 medium red or yellow bell pepper, diced
- 8 oz. angel hair pasta, cooked
- 2 tbsp. melted butter
- 2 tbsp. balsamic vinegar
- 2 tbsp. Italian dressing
- ½ cup grated Parmesan cheese
- 1 tsp. dried oregano
- 1 tsp. dried basil
- salt and pepper to taste

Marinate venison, onions and peppers for three to four hours in the refrigerator, turning often to coat well. Thread onto skewers and grill until venison is rare to medium rare. Remove from skewers. Toss cooked pasta with remaining ingredients; adjust spices to taste. Toss with venison cubes. Serve with crusty bread. Serves four. ⚀



Reminiscence on CANVAS

Painting wildlife has been Bob Timberlake's passion for three decades.

captions by Bob Timberlake

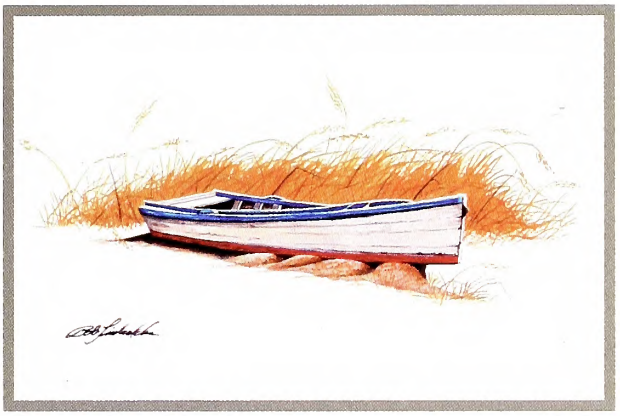
The Ritual

The migration of Canada geese is a ritual, something that I've always looked forward to. I usually have about 200 of them that winter at my studio. As the sound of "goose music" fills the air, I know that chilly days are soon to follow.

Since before he could read, Bob Timberlake has been drawing pictures of wildlife. Back in his preschool years, Timberlake used to listen with fascination as his older brother, Tim, told him tales of camping trips little Bob was too young to go on. Bob would draw pictures of the gear his brother took along, eagerly anticipating the day he could join Tim in the woods.

Ever since, the younger Timberlake has spent a lot of his life in the wild. A lifelong Lexington resident, Timberlake fly-fished, participated in Boy Scouts and captured flying squirrels and lightning bugs to take to school for show-and-tell. He and his brother even built a cabin together when they were adolescents, a crude building that was nothing special to look at but was paradise to the boys.

In the years since those idyllic days, Timberlake has become one of North Carolina's most well-known artists. He is noted for his sentimental, realistic paintings of places and scenes that harken back to a simpler time. Many of those images include wildlife or objects used by people who love the outdoors—decoys, canoes or fishing lures.



Rowboat Study

The coast of North Carolina has always been one of my favorite places, especially the abandoned Coast Guard station on Bald Head Island, where I painted this scene in the early 1970s.

Geese are a frequent subject of Timberlake's work, because he has always felt a special affinity for the migratory species. "They fascinate me," Timberlake said. "They seem so cosmopolitan. They could be in Canada in the morning, have lunch on the Mississippi Delta and have dinner in New Orleans."

This retrospective represents a small sampling of Timberlake's work featuring wildlife-related themes. The artist says it would take him 10 lifetimes to paint all of the subjects he would like to. At this stage of his career, he derives much pleasure from reminiscing about his reasons for choosing his subjects.

"My paintings conjure up memories for me," Timberlake said. "Most of the ones I do have stories."

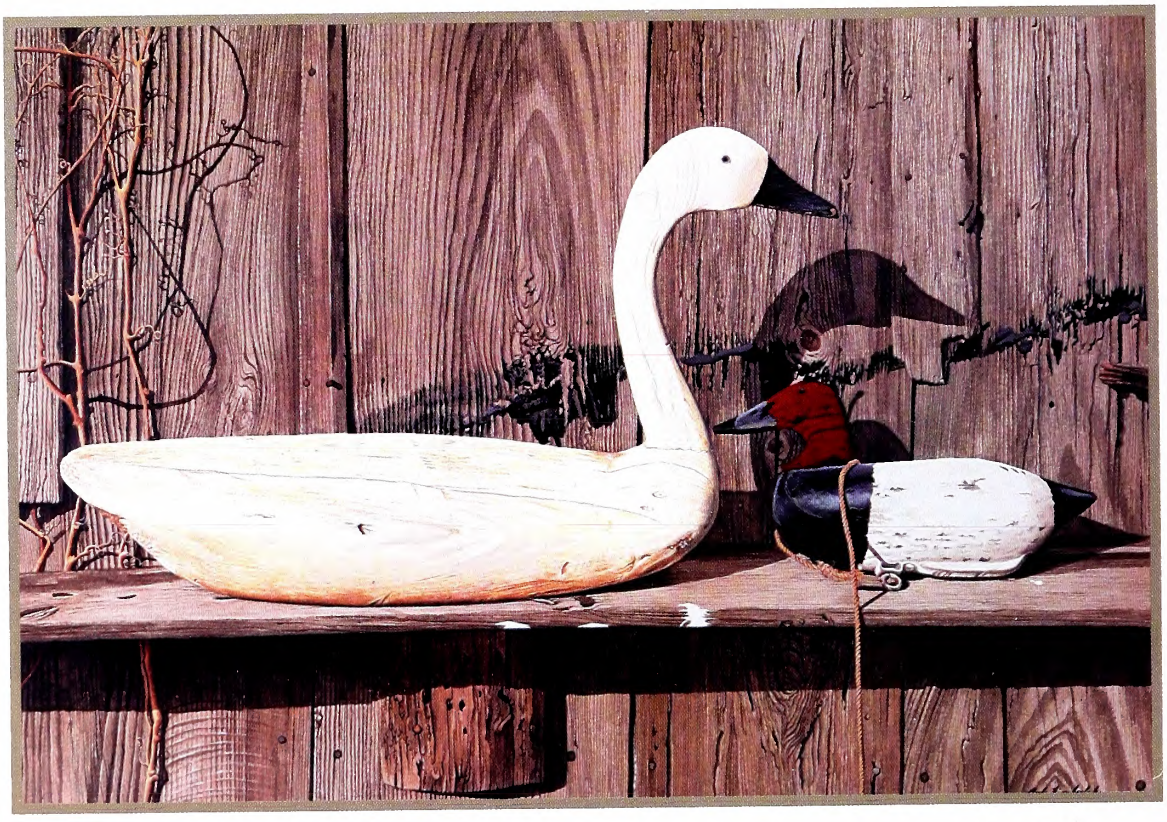
—*Greg Jenkins*

Joe Lincoln's Goose

Cold mornings, wet dogs, whistling wings and the smell of the marsh . . . and good friends to share it with. Who could ask for anything more?

Fox Study

Time spent in the woods is its own reward. If you spend enough time there, you might be lucky enough to meet up with some sly critter, as I did while walking behind my studio one afternoon.

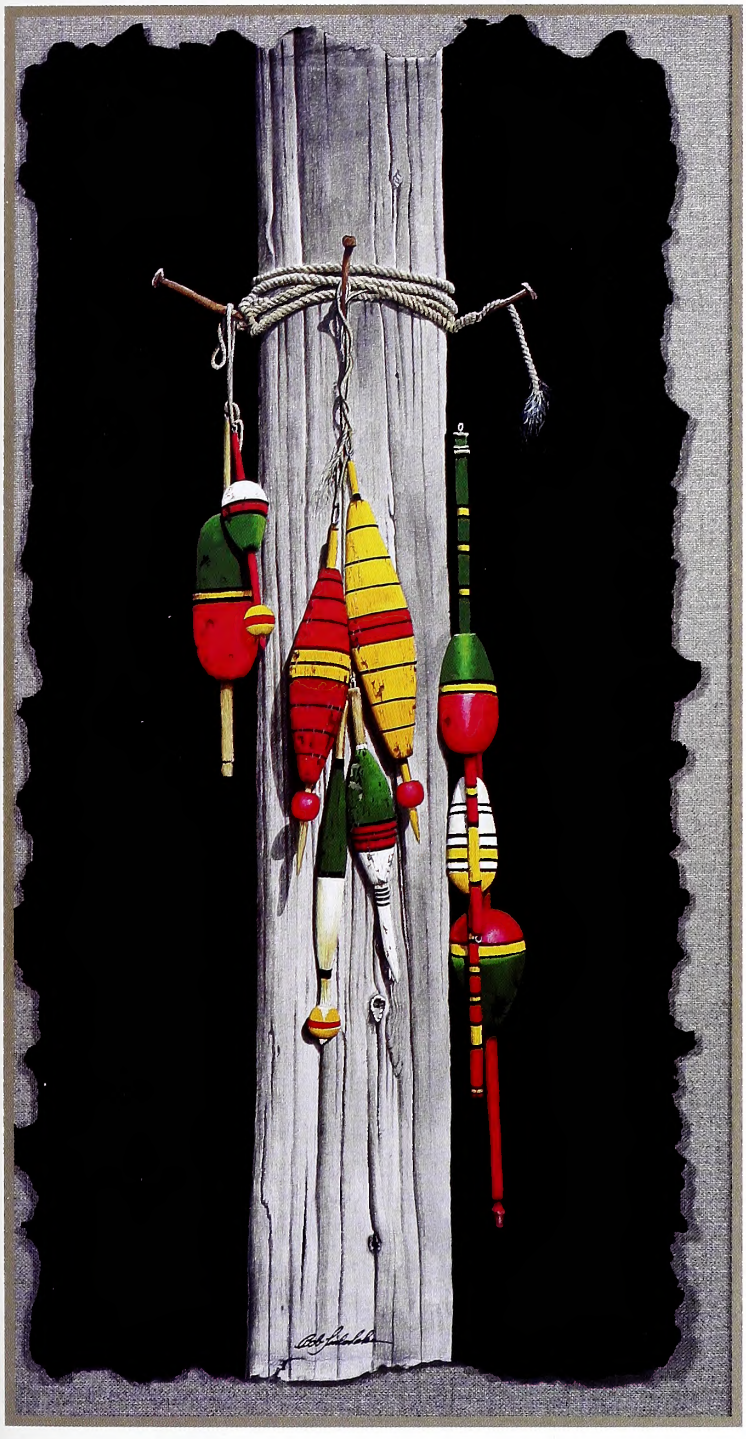


Knott's Island Decoys

This painting features a pair of working decoys from Knott's Island, N.C., where I have duck-hunted for many years with my dear friend and hunting partner Ronnie Wade. Knott's Island has a long-standing tradition of waterfowling and decoy carving.

Canoe Study

I have always had a fascination for canoes, with their graceful lines, gliding quietly and in perfect balance through the water.

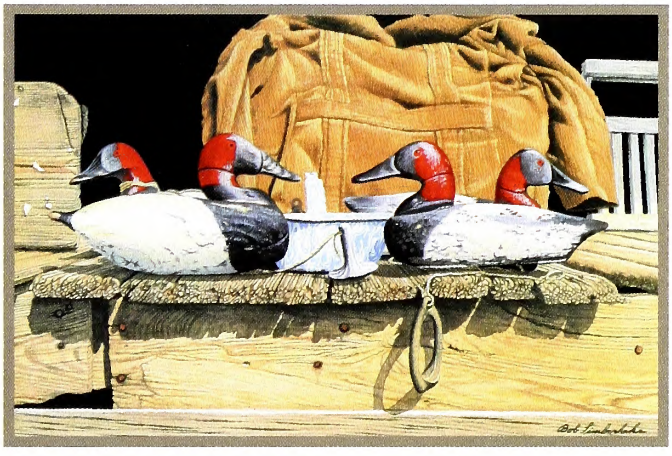


Bobbers

Every child should have the excitement of watching a bobber disappear into the dark waters of a bream pond, especially when they are on the other end of the pole! There is an education here that goes far beyond fishing.

Four of a Kind

My old corduroy jacket had seen about as much wear and tear as these old canvas-back decoys when I painted this scene at my Riverwood Studio.



Bring Bob Timberlake into Your Home

Readers of Wildlife in North Carolina have the unique opportunity this fall to purchase Bob Timberlake's 2003 limited-edition prints, "Winter Portfolio," from the N.C. WILD Store. Please turn to page 37 for ordering information.

Have you ever found an unusual branch, odd leaf or blob of goo, and wondered

What Is That ?

written by Buffy Silverman / illustrated by Consie Powell / nature activity by Anne M. Runyon

WHO CRAWLED THERE?

You wander in the woods on a cool November day. Picking up a fallen branch, you notice that someone has carved thick and thin grooves into the wood, forming a beautiful pattern. Who was the artist who decorated your walking stick?

Bark beetles made these patterns. These beetles spend most of their lives under bark. They tunnel their way through logs and trees, chewing wood as they go.

After mating, a female bark beetle chews a thick channel, then lays eggs in notches along the sides. Wormlike **larvae** hatch from the eggs and eat wood, forming skinny tunnels on either side of the main channel. As the larvae grow, they make tunnels wider and wider until they carve a space to **pupate**. When they become adults, the bark beetles chew their way out through the bark.

Like many insects, bark beetles spend most of their lives unnoticed. But they leave a record of their **life cycle** that you can recognize. Look under the loose bark of dead trees, or on logs or fallen branches to find their tunnels.

HIDDEN IN THE LEAVES

A snakelike trail winds across a leaf. Holding the leaf up to the light, you see something wriggle inside. A tiny leaf miner, the larva of a miner moth or fly, lives inside the paper-thin leaf. How did it get inside?

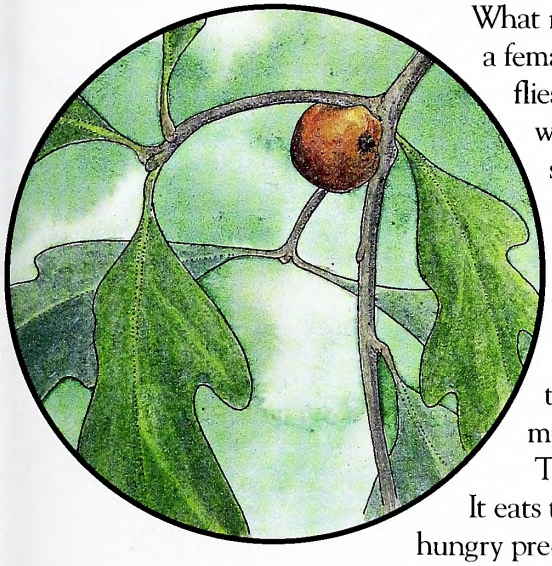
The miner moth (or fly) flew to a leaf and laid her egg on the surface. When the egg hatched, the larva ate its way inside and began its hidden journey.

The flat larva tunnels through the leaf like a worm crawling in soil. All the food it needs is in the thin space between the top and bottom of the leaf. Its jaws point forward, grabbing the juicy middle of the leaf and leaving behind the tough outer surfaces. Like the tunnel of a bark beetle larva, its tunnel grows wider as the larva grows larger. It leaves its shed skin and **frass** in its tunnel.

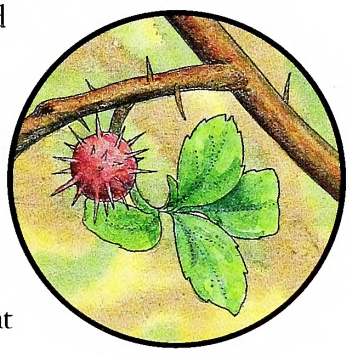
When it is ready to pupate, a leaf miner chews a chamber inside the leaf with an exit hole. Some leaf miners spend the winter inside a fallen leaf. They emerge as flying adults in the spring. Look for different shapes of mines on the leaves of many kinds of plants.

INSIDE A GALL

All year you can find swollen growths on stems, branches and leaves of many plants. These odd-shaped structures are insect homes called galls. Many different kinds of insects, including flies, wasps, moths or beetles, live in galls.



What makes a plant grow a gall? After a female gallmaker insect mates, she flies to the same species of plant where she began her life. There she lays an egg inside the plant, and also inserts a chemical. The chemical changes the way the plant grows, sometimes causing it to swell and form a gall around the egg, like a tumor. In some plants, it is the larva tunneling and feeding that irritates a plant and makes it form a gall.



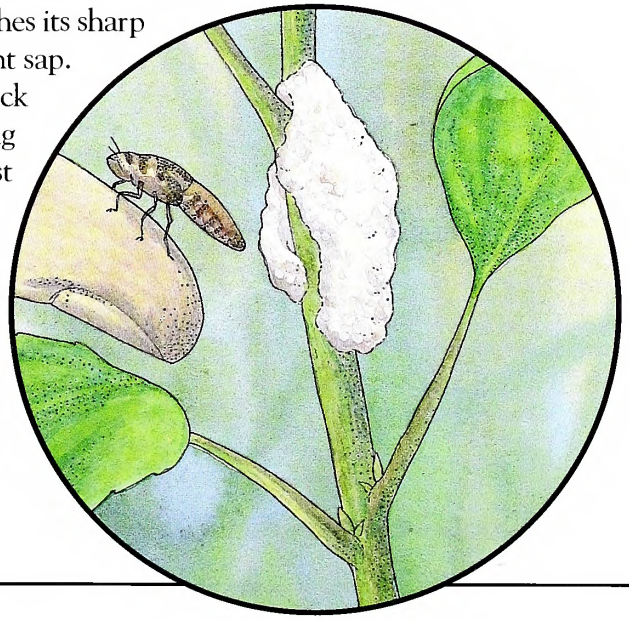
The growing larva is surrounded by food. It eats the walls of its home. It is also hidden from hungry predators. A gall insect usually stays inside its gall until it is an adult.

Sometimes other insects move into a gallmaker's home and share its food and shelter. Certain predators know that they can find a meal inside a gall. Chickadees and downy woodpeckers hammer into ball galls that grow on goldenrod stems and eat the fly larvae inside. Ice fishermen looking for bait also crack open goldenrod galls.

SPITTLEBUGS

While walking through a field, you notice frothy-white bubbles on tall grasses and weeds or on pine needles. Look carefully inside one of these spittles and you'll find a spittlebug.

In the spring, a young spittlebug (called a **nymph**) hatches from an egg. It immediately turns upside down on a plant stem and pushes its sharp beak into the stem. Using its beak like a straw, it sucks plant sap. The sap has very little sugar in it, so the spittlebug must suck and suck to get enough nourishment. Every day a spittlebug sucks at least 150 times its own weight in sap. Most of this liquid is waste—it bubbles out of the spittlebug's rear end and covers it in spittle. This slimy covering protects the nymph from hot, dry weather and from predators. In the fall, female spittlebugs lay eggs on weed stems or pine trees.

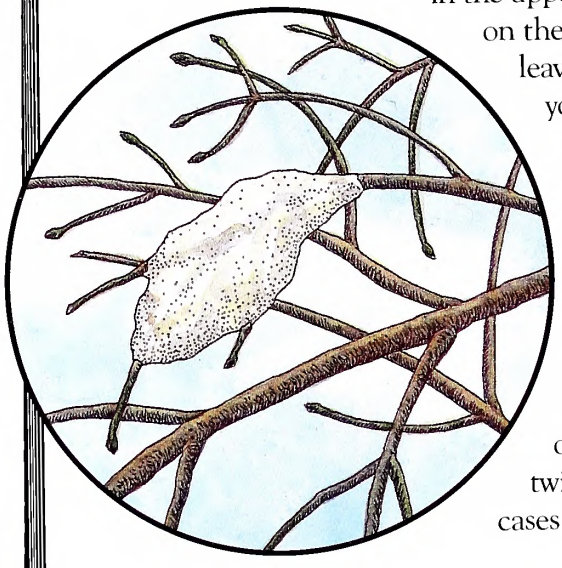


NESTS

Some insects live in groups for part of the year. In late fall and winter, you can find the nests that were once their homes.

Look up at an ash, cherry, willow, apple or other **deciduous** tree. The ends of the branches are wrapped in silk. Inside this web, fall webworm caterpillars munch on leaves.

In early summer, a female tiger moth lays hundreds of eggs on the undersides of tree leaves. When the webworm caterpillars hatch, they spin silken webs that cover the tips of branches, usually in the upper parts of a tree where sun shines on the nest. The webworms feed on the leaves they have covered. Inside the nest, you can find the caterpillars' shed skins and frass. After **molting** five times, a caterpillar leaves the nest and forms a cocoon under the tree's bark.



You might also notice web nests in the forks of tree branches. In the spring, tent caterpillars construct these nests. When tent caterpillars leave their nest to feed on tree leaves, they lay down strands of silk. They follow the silk trails back to the nest, and their nestmates follow the trails to find food. Stinkbugs also follow these trails and munch on the caterpillars. In the winter, look for egg cases of tent caterpillars on twigs of black cherry, chokecherry and apple trees. The shiny, inch-long cases contain 200 to 300 eggs.

What Does It Mean?

deciduous: shedding leaves in fall and remaining bare during winter

frass: the waste or feces of an insect

larva (plural: larvae): the immature stage of an insect between an egg and a pupa, not resembling an adult and often living in a different habitat

life cycle: the stages that an animal goes through as it develops and matures

molting: shedding the skin (cuticle)

nymph: the immature stage of insects that do not have a pupa, usually resembling an adult but without wings or reproductive organs

pupate: to turn into a pupa, the stage between a larva and an adult; a nonfeeding and usually inactive stage

Read and Find Out

- *The Big Bug Search* by Caroline Young, EDC Publications, 1997.
- *The Book of Forest and Thicket* by John Eastman, Stackpole Books, 1992.
- *Bugs in 3-D* by Mark Blum, Chronicle Books, 1998.
- *Caterpillars, Bugs and Butterflies (Take Along Guide)* by Mel Boring, NorthWord Press, 1999.
- *Eyewitness: Insect* by Laurence Mound, DK Publishing, 2000.
- *Flies Taste With Their Feet: Weird Facts About Insects: A Weird-But-True Book* by Melvin Berger, Scholastic Paperbacks, 1997.
- *Insectlopedia* by Douglas Florian, Harcourt, 1998.
- *Insects (National Audubon Society First Field Guides)* by Christina Wilsdon, Scholastic, 1998.
- *Stink Bugs, Stick Insects and Stag Beetles: And 18 More of the Strangest Insects on Earth* by Sally Kneidel, John Wiley & Sons, 2000.

Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at **www.ncwildlife.org** and click the link for **education/workshops**.

Get Outside

Make a gall museum. Look for galls on the leaves and stems of many plants, especially on oak trees, apple trees, willow trees, goldenrods and daisylike flowers. Can you find tiny "button" galls covering an oak leaf? Perhaps you can collect an "oak apple" gall on an oak leaf or twig. Maybe you will find a prickly "hedgehog" gall on oak leaves. Record the date, place and type of plant where you find each gall.

Ask an adult to cut open some galls. What do you find inside? You might see frass, shed skin and the hole where an insect emerged. You might find evidence of many animals living in a gall. Maybe you will find a larva still living in a gall. An empty gall could mean that a predator or parasite ate the gall dweller.

It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

Wildlife is Everywhere teaches students to understand that wildlife is present in many unexpected places.

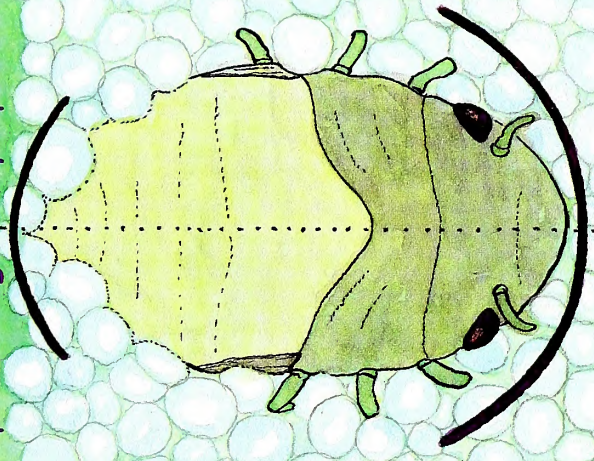
Urban Nature Search teaches students to generalize that each environment has characteristic life forms.

Pop-Up Spittlebug Card

1. Cut along all the thick black lines.
2. Fold the whole card in half.
3. Fold the card shut.
4. Fold the spittlebug up like a tent inside the card.

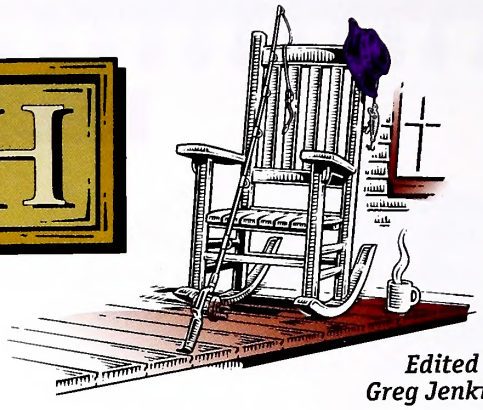
Who is hiding in this froth?

A spittlebug nymph.



BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

N.C. DIVISION OF MARINE FISHERIES

Some Fish Stocks Show Improvement

Red drum, North Carolina's official state saltwater fish, has been upgraded from overfished to recovering based on a recent stock status report issued by the state Division of Marine Fisheries (DMF). Other stocks showing improvement include summer flounder, which moved from recovering to viable, black sea bass north of Cape Hatteras, which advanced from overfished to viable, and scup, which was elevated from overfished to recovering.

Fishery Management Plans map out proactive long-term recovery strategies for fisheries. North Carolina is developing these plans for all its major fisheries. The news is not all good: Black sea bass south of Cape Hatteras and striped bass in central and southern state waters were both downgraded from concerned to overfished. Stricter size and bag limits should help address the decline in sea bass stocks, while development of a new plan including striped bass in all coastal waters should eventually turn that stock around in the central and southern areas.

The DMF's annual stock status report evaluates the health of North Carolina's important coastal fisheries. Of the 40 stocks listed, 16 fall into the viable and recovering categories, nine are listed as concerned, nine are listed as overfished and six are listed as unknown. Visit the DMF's Web site at http://www.ncdmf.net/stocks/index.html to view the new stock status report, along with species profiles and a glossary of fisheries terms.

2003 Stock Status

Viable

block seo boss (north of Cape Hotteras), striped bass (in Albemarle Saund), dolphin, wohao, summer flaunder, gog grouper, king and Spanish mockerel, Atlontic menhoden, spot, spotted (speckled) seatraut, shrimp, weakfish (gray traut)

Recovering

bluefish, red drum, scup

Concerned

Atlontic craaker, striped mullet, white and yellow perch, reef fish, Americon shod, bay scallops, oysters, blue crabs

Overfished

black seo bass (sauth of Cape Hotteros), striped bass (in nan-marine woters, Albemorle ond Roanoke saunds), southern flaunder, river herring (in Albemorle Saund), mankfish, sharks, spiny dagfish, Atlontic sturgean, toutog

Wildlife through the Year

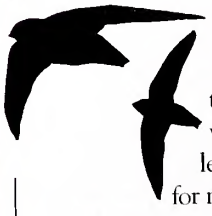
A Swift Birdhouse

The first time I ever heard them was as a child, and I thought my grandmother's house was haunted. What possibly could be making such a racket? The noise sounded as if it was coming from behind the wall. Or was it coming from inside the furnace?

I soon discovered that my poltergeist was none other than birds called chimney swifts. Chimney swifts often pass through North Carolina as they head for wintering areas in southern climes.

They naturally roost and raise young in hollow trees. But with deforestation and the loss of large hollow trees, the birds easily adapted to man-made structures such as chimneys and air shafts.

If unwelcome chimney swifts take up residence in your house, an easy solution to the problem is to cap the chimney once they've left so the birds cannot return. To provide an alternative roost, consider constructing a chimney swift tower.



It can be nothing more than a 20-foot-tall wooden structure with a diameter of at least 16 inches. Plans for making such a tower can easily be found over the Internet at http://www.concentric.net/~Dwa/page52.html.

—*Chris Powell*

DU Begins New Wetlands Project

KEN TAYLOR

Ducks Unlimited has launched a new program called Sound CARE, a comprehensive conservation initiative designed to restore, enhance and protect wetland habitat to benefit waterfowl and other wetland-dependent species.

CARE stands for Conservation, Agriculture, Resources and the Environment. The impetus behind the program is the continued loss and degradation of wetland habitat within the state and the importance of the breeding grounds to waterfowl that winter in North Carolina. More than 50 percent (nearly 6 million acres) of the state's precolonial wetlands have been lost, mainly due to development, agriculture and silviculture. Coastal wetlands are at the greatest risk because of the pressures of development, agriculture and other impacts on water quality.

Ducks Unlimited plans to raise $22 million for Sound CARE over the next five years to conserve a minimum of 64,000 wetland acres: 22,000 wintering acres in North Carolina and 42,000 acres in northern breeding grounds. The program will focus on long-term habitat conservation of wintering grounds and breeding sites through property acquisition and conservation easements. Ducks Unlimited will partner with private landowners, corporations, nonprofit organizations and local, state and federal agencies.

On Patrol

Sgt. John Campbell and Master Officer Tony Pennell found a truck parked on a path in the woods in Wilkes County during bow season. Seeing a bow behind the seat, the officers waited for the subject to return to his vehicle. After dusk, the subject, who was not wearing blaze orange (violation No. 1), came down the path carrying a shotgun. Campbell asked to see his ammunition, and the hunter produced small shot from one pocket, saying he had been squirrel hunting. When Campbell asked to see the rest of his ammo, the hunter handed over two buckshot shells, which he said he had just in case he saw a big buck while he was out (violation No. 2). Campbell asked what was in the rest of the hunter's pockets, the man said, "I killed a turkey, and I have the beard in my pocket, too," as he revealed a big 10-inch turkey beard. The hunter led the officers back into the woods, where he had left his closed-season turkey (violation No. 3).

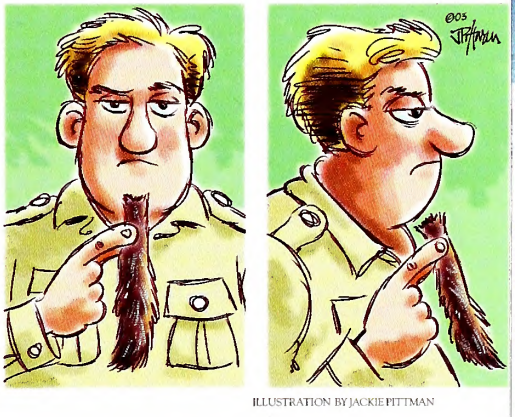


ILLUSTRATION BY JACKIE PITTMAN

Linden Angler Catches World-Record Hogfish

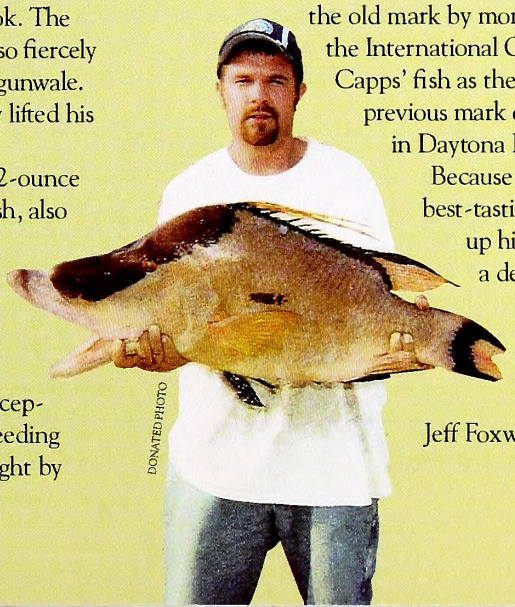
For a guy who almost missed the boat, Trevor Capps had a pretty good day fishing on June 27. As a Father's Day gift, Capps and his brother, Troy, took their dad, Justus, fishing on the *Winner Queen*, a head boat out of Carolina Beach. When they arrived at the dock, there was no bait available for sale, so Trevor walked a half-mile to a tackle shop. When he returned, he hopped on the boat and it pulled away.

About 2:30 p.m. on the sunny, clear and hot day 43 miles off the beach, Capps decided to try a cigar minnow on his lower hook. The tackle bounced once on the bottom and was hit by something so fiercely that it yanked Capps' arms down and whacked them on the gunwale. As the fish hunkered down on the bottom, Capps repeatedly lifted his rod and cranked his reel.

Seven or eight minutes later, Capps boated a 19-pound, 12-ounce hogfish, a reef species rarely caught on a hook and line. Hogfish, also known as hog snappers, are members of the wrasse family that feed on mollusks, crustaceans and sea urchins. They have a long, upturned snout with prominent lips and canine teeth, allowing them to root for food. North Carolina is considered the northern end of its range, which extends down to Brazil.

Hog snappers weighing 20 to 25 pounds are considered exceptionally large; the average size is 6 pounds. Because of their feeding habits, they rarely chase bait. The majority of this species caught by sportfishermen is harvested by divers with spear guns. Hogfish feed mainly in the morning and evening, making Capps' afternoon catch even more uncommon. "When you figure out the odds of catching this fish—the size, the time, the bait, the location—it's like winning the lottery," said Capps, who hails from Linden.

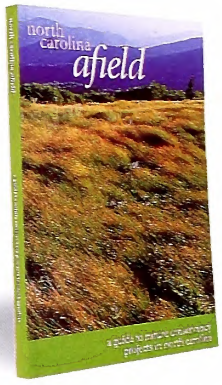
Capps' trophy hogfish, 33 1/8 inches long and 27 1/4 inches in girth, was certified as the North Carolina state record in August, breaking the old mark by more than 6 pounds. In October, the International Game Fish Association certified Capps' fish as the all-tackle world record. The previous mark of 19 pounds, 8 ounces was set in Daytona Beach, Fla., in 1962.



DONATED PHOTO

Because hog snappers are considered the best-tasting of all the reef fish, Capps cut up his prize and ate it. "It was great—a delicacy," said Capps, who felt guilty about consuming a world-record fish. "If you catch the world-record fish and eat it," he joked, referencing comedian Jeff Foxworthy, "you may be a redneck."

—*Greg Jenkins*



Book Review: North Carolina Afield

Most outdoor enthusiasts know that a good field guide can make the difference between a miserable experience and an invigorating day spent enjoying nature. Frequent *Wildlife in North Carolina* contributor Ida Phillips Lynch has put together a new book about North Carolina wild places that is sure to be a difference-maker. Chock full of useful information, "North Carolina Afield: A Guide to Nature Conservancy Projects in North Carolina" takes a fact-filled look at sites from Stone Mountain to Bald Head Island.

The book lists parks, refuges, game lands and preserves by region. Lynch guides the reader to find and enjoy each of 92 different natural areas. Descriptions include contact information (address, phone, Web site, etc.), flora and fauna, total acreage and a trip planner with driving directions, don't-miss highlights and recommended activities. The book even tells readers which N.C. Geological Survey topographic map to buy for each area and where to get them.

Color photos of landscapes, plants and animals give a preview of what adventurers can expect, while the "Partners in Conservation" section provides information on how to contact the state or federal agencies that manage these areas. The book is not intended to be a comprehensive guide to every wild area in the state, or even all of the Nature Conservancy's projects. Instead, it is a map to the areas that offer the best possibilities for outdoor recreation. Ecologically sensitive locations where human presence is discouraged are not included.

"North Carolina Afield" will please those in need of an easy-to-read field guide and will serve as a reminder to armchair travelers of the incredible natural beauty they are missing.

North Carolina Afield by Ida Phillips Lynch, John F. Blair Publisher, paperback 2003, $14.95; available from bookstores, outfitters or the publisher: 1-800-222-9796, www.blairpub.com.

did YOU know?

Fishermen will receive either a $5 reward or a hat from the N.C. Division of Marine Fisheries (DMF) for turning in information on tagged crabs. The DMF is conducting a study on the migratory behavior of female blue crabs in which 7,500 will be tagged this fall. North Carolina's blue crab fishery was valued at $29.3 million in 2002, making it the most lucrative fishery in the state.

Fishermen should remove the yellow tag wired to the crustacean's back and record the tag number, date and location of capture, gear used, and whether or not the crab has a sponge or egg mass. Mail this information to N.C. Division of Marine Fisheries, Attention: Crab Tagging Study, P.O. Box 769, Morehead City, NC, 28557, or call (252) 726-7021 or 1-800-682-2632.

Some crabs will have two tags on their shell; the award for a double-tagged crab is $20. All fishermen returning tag information will be eligible for an annual drawing for cash prizes.

Nature's Ways

A Blackbird of a Different Color

written by Clyde E. Sorenson
illustrated by Jim Brown

For most of us, blackbirds are the noisy, boisterous red-winged blackbirds, cowbirds and grackles that flock by the thousands in fallow crop fields, gather in huge communal roosts in the winter and occasionally descend on our backyards to raid our bird feeders. The rusty blackbird, however, is cut from different cloth.

Unlike the others, rusty blackbirds don't nest in North Carolina. They breed in wetlands in the great boreal forests of Canada. When they arrive here, they're not black but rather a rich chestnut brown, with bright-yellow eyes. Over the winter, the brown tips of their feathers wear off, revealing their glossy-black breeding colors.

Also unlike our other blackbird species, rusty blackbirds generally avoid open fields and huge flocks. They much prefer bottomland forests and swamps. They tend to forage rather quietly in flocks of 30 or 40 rather than hundreds or thousands like other blackbird species.

Unfortunately, rusty blackbirds differ from their cousins in another way. While populations of other blackbird species are generally holding their own, rusty blackbird populations are dropping dramatically. Scientists suspect that changes in their breeding range brought on by climate fluctuation and development of bottomlands may have contributed to the decline.

Calendar of Events

SATURDAY, NOV. 1

Bike around the state's largest natural lake at the Mattamuskeet Fun Ride in Swan Quarter. Contact Margie Brooks at hydecocc@direcway.com or (252) 926-9171, or visit www.hydecounty.org/events/fun_ride.htm.

SATURDAY, NOV. 8

- Go on a guided evergreen hike with park ranger Tim Benton at Lake James State Park in Nebo. Call (828) 652-5047 or visit www.ncsparks.net.

- Take a giant step back in time and check out exhibits, displays and activities at the Fossil Fair held at the N.C. Museum of Natural Sciences in Raleigh. Visit www.naturalsciences.org or call (919) 733-7450.

SUNDAY, NOV. 9

Enjoy a moonlight walk at the Broad River Greenway in Boiling Springs. Call (704) 434-0040 or visit www.broadrivergreenway.com.

FRIDAY–SATURDAY, NOV. 28–29

Compete in the Anson County Big-Game Hunt Tournament. Contact Elbert Marshall at ansonchamber@alltel.net or (704) 694-4181, or visit www.ansoncounty.org.

SUNDAY, NOV. 30

Join a guided walk to see returning winter birds at Chimney Rock State Park. Visit www.chimneyrockpark.com or call 1-800-277-9611.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to greg.jenkins@ncwildlife.org, or call (919) 733-7123, Ext. 264.

Wildlife Endowment Fund Report

Fund Balance $53,946,647.28

Established on May 29, 1981, this fund is derived from the sale of lifetime hunting and fishing licenses and lifetime subscriptions to Wildlife in North Carolina *magazine, as well as from tax-deductible contributions. Although the interest may be used to supplement N.C. Wildlife Resources Commission programs, the principal remains invested to generate additional interest for the future.*

Recent Wildlife Commission Land Acquisitions

Tracts of land acquired by the N.C. Wildlife Resources Commission are purchased mainly with grants from the N.C. Department of Transportation's Ecosystem Enhancement Program, the Clean Water Management Trust Fund and the N.C. Natural Heritage Trust Fund. Money from the commission's Wildlife Fund and Wildlife Endowment Fund is occasionally used, and some properties are donated.

For more information on game lands, consult the hunting and fishing maps in the 2003-04 Game Lands publication. See your local wildlife agent for a copy, call (919) 733-7291 to request one, or visit the commission's Web site at www.ncwildlife.org and click on the link for regulations.

Tract	Acres	County	Game Land	Est. Value
Pugh	120	Hyde	Gull Rock	$300,000
Barker I	33.5	Caswell	Caswell	$67,000
Barker II	83	Caswell	Caswell	$166,000
Hodges	125	Caswell	Caswell	$250,000
Brumley	300	Caswell	Caswell	$600,000
CZR	100	Pender	Angola Bay	Donation
Waccamaw	1,945	Columbus	Columbus Co.	$2.92 million
Pee Dee	1,965	Richmond	Pee Dee River	$3.93 million
Whitehurst	141	Pamlico	Neuse River	$1 million
Collier	2	Currituck	Currituck Banks	Donation
Lost Bridge	160	Macon	Nantahala	$500,000
Mingo	5,621	Caldwell/ Wilkes	None	$21.5 million
Total: 12	**10,695.5**	**10**	**8**	**$31.23 million**

Letters to the Editor

To the editor,

The Oregon Inlet article (July 2003 WINC) brought back memories of the many different viewpoints expressed during the litigation challenging the permit to construct the groin. Emotions ran so high on the issue, and the project was so political, it was difficult to determine the truth. NCDOT has had plans to replace the Herbert Bonner Bridge for a long time, not only because of the migrating inlet, but because the maintenance costs of the existing bridge run high. Some wag suggested the existing bridge was being kept in place to justify construction of the groin, but of course, that is ridiculous. A barge almost knocked the bridge down once, so it is at risk.

Opponents viewed the groin as a mini-stage of the jetty project and a violation of the state policy against hard structures on the shoreline—a policy which has figured in issues of endangerment of other structures by migrating inlets. Of course, opponents of the jetties suggest they would also violate this policy. Enjoyed the article.

—Jim Richmond
via e-mail

JODY DUGGINS

Herbert C. Bonner Bridge at Oregon Inlet

Prepare Dogs for Success Afield

For many hunters, watching a favorite dog perform a classic flush or retrieve is the best part of their bird hunting experience. Before you take your best friend out hunting, take time to prepare your dog for success.

1. Keep your dog's energy up. Hunting dogs need nutrient-rich food. Make sure they eat well before a hunt, and carry high-carbohydrate dog snacks with you.

2. Keep your dog hydrated. Whether it's hot or cold outside, carry plenty of water and offer your dog water hourly—more often when it gets hot.

3. Keep your dog's temperature in check. When it is hot, rest your dog in a cool, shaded area. When traveling, dogs should always ride in protected, well-ventilated areas to prevent overheating, overexposure or vehicle exhaust inhalation, a leading cause of sporting-dog deaths. On cold days, especially where dogs may get wet, make dry, warm bedding available.

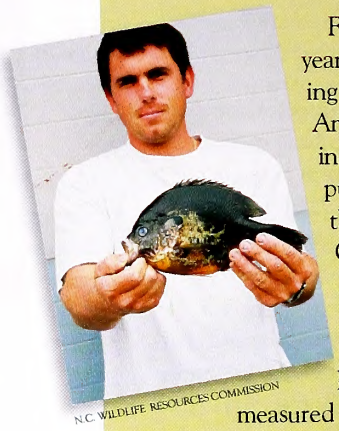
4. Keep safe. For upland dogs, rubber or leather dog boots help prevent the cuts and worn pads that can bring a hunt to a premature end. Blaze-orange vests, reflective collars and bells can help you keep track of your dog and prevent shooting accidents.

5. Prepare for emergencies. A first-aid kit, blanket and extra food and water can save the day. A good first-aid kit for dogs should include a dog-specific first-aid manual, sterile rinse solution, alcohol pads, gauze pads and wraps, gauze tape, a towel, iodine, scissors, tweezers, cotton balls and swabs, a 10cc syringe, vinyl or latex gloves and antibiotic ointment.

KEN TAYLOR

6. Prior preparation saves the day. Training and conditioning can prevent a wide variety of injuries. A well-cared-for dog will hunt harder, last longer and enjoy a day afield much more if it has conditioned muscles and toughened footpads from lots of exercise and play.

State Pumpkinseed Record Broken Again



N.C. WILDLIFE RESOURCES COMMISSION

For the third time this year, a state freshwater fishing record has been broken. Angler John Koonce reeled in a 1-pound, 6-ounce pumpkinseed sunfish from the Trent River in Jones County on May 21. His catch weighed nearly three times the previous state record. Koonce caught his record-breaker, which measured 11 inches in length and 11 1/2 inches in girth, using diced eel as bait.

An eel farm owner from Trenton, Koonce had been fishing his regular hole under the Free Bridge for less than 30 seconds when the pumpkinseed snatched the bait. "I've fished that spot my whole life and have caught plenty of smaller sunfish but never one that big," Koonce said. "I didn't know what the record was, but I thought I could get a citation for it. It was pretty exciting to find out it was a new state record."

The previous pumpkinseed record was held for 12 days by Benson angler James C. Wood, who caught an 8-ouncer from Parker's Pond in Johnston County on May 9.

To qualify for a state record, anglers must have caught their fish on a hook and line, have their fish weighed on a certified scale witnessed by one observer, have the fish positively identified by a qualified expert from the commission and submit an application with a full, side-view photo of the fish.

Import Ban Lifted on Wild Game from Canada

Good news for hunters planning to hunt big game in Canada: The U.S. Department of Agriculture (USDA) reviewed its safeguards against bovine spongiform encephalopathy (BSE, also known as mad cow disease) and announced it would lift a ban on importation of wild ruminant products from Canada. Ruminants include deer, elk, moose, bison, sheep and caribou. In May 2003, the USDA temporarily halted imports of live ruminants and most ruminant products from Canada after a cow in Alberta was found infected with BSE. Since then, no other infected animals have been found.

Hunters can bring wild ruminant meat and other parts intended for personal use into the United States, but they will need a "Veterinary Services Special Permit for the Importation of Hunter-Harvested Wild Ruminant Meat," along with one of the following: a valid Canadian export certificate for game meat, a copy of a valid hunting license or a valid hunting tag. The permit can be downloaded from http://www.aphis.usda.gov/lpa/issues/bse/bse.html or obtained by calling the USDA's National Center for Import and Export at (301) 734-3277.

Catch Us at these *Numbers*

1-800-662-7137 to report violotions of hunting ond fishing lows

1-800-628-3773 (NC VESSEL) for boot registrotion ond titling

1-800-675-0263 for hunting dotes ond shooting hours for migrotory gome birds

1-888-248-6834 (2HUNTFISH) to purchose most licenses with VISA or MosterCord using o touch-tone telephone

1-800-446-8663 (I GOT ONE) to report big game harvests

Connect to the commission's Web site ot www.ncwildlife.org

Calls are answered in order, but some numbers may require a wait during busy seasons.

N.C. WILD STORE

A *Winter* PORTFOLIO

by Bob Timberlake

Snow falls on a tin roof while turkeys stand watch in the gray light. A long-abandoned farm wagon fills up with snow. These two winter scenes by North Carolina artist Bob Timberlake make up a special edition that we can offer for a limited time only. Reproduced in offset lithography, "*Nay's Turkeys*" and "*Covered Wagon*" are printed on museum-quality archival stock and numbered as a matching set. Both reproductions are hand-signed by the artist; they include hand-deckled edges and debossed panels around the image. Overall size on each reproduction is 15 3/4" x 20"; the image size is 10 3/4" x 16".

Orders will be accepted only until November 15, 2003. The number of prints will be determined at the end of the reservation period.

PRINT SET
$250 ITEM CODE **FA2**

A $15.00 shipping fee and 7% N.C. sales tax apply.

See order form insert.

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

▲ Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free *Gardens for Butterflies* guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

▲ Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

Hat not for sale.

left front design

▲ **Largemouth Bass.** This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12LRG** (large)
A12XXL (extra extra large)
Extra large size is no longer available.

left front design

▲ **Snow Geese.** Celebrate waterfowl conservation with this white, all-cotton tee. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this all-cotton tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo.

$14.50 ITEM CODES:
A13MED (medium) **A13XLG** (extra large)
A13LRG (large) **A13XXL** (extra extra large)

◀ **Sporting Dogs of North Carolina Poster Set**
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail and tree. Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

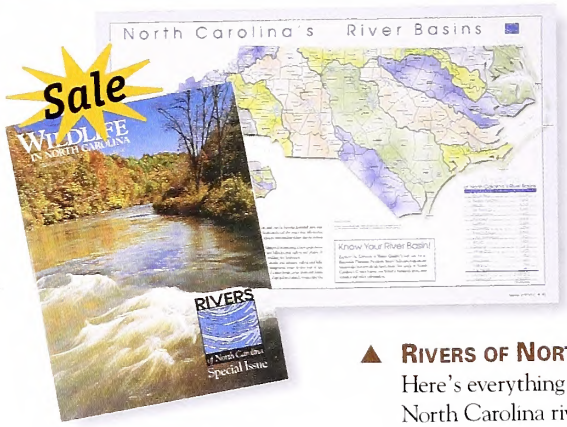
Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams. Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**

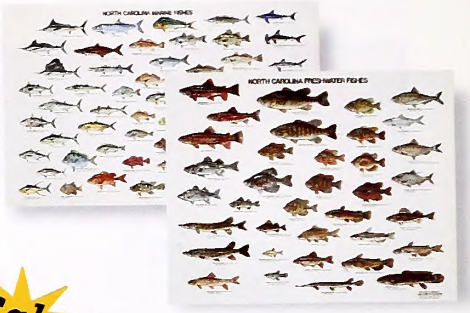


▲ Rivers of North Carolina

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* (Nov. 1999) chronicles the natural history of 17 major river basins.

Half-price while supplies last.

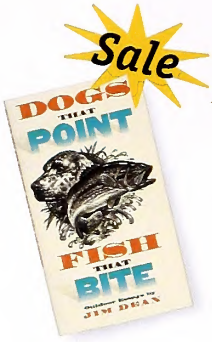
$5 ITEM CODE **M11**



Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**



◀ Dogs that Point, Fish that Bite

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

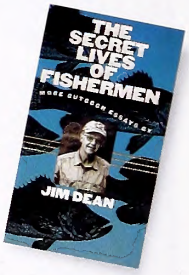
Hardbound ~~$19.95~~ $14.95

ITEM CODE **M8**

Paperback ~~$10.95~~ $8.00

ITEM CODE **M12**

Set of both volumes
Hardbound $30.00
ITEM CODE **M14**



The Secret Lives of Fishermen ▶

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound ~~$24.95~~ $18.50

ITEM CODE **M13**

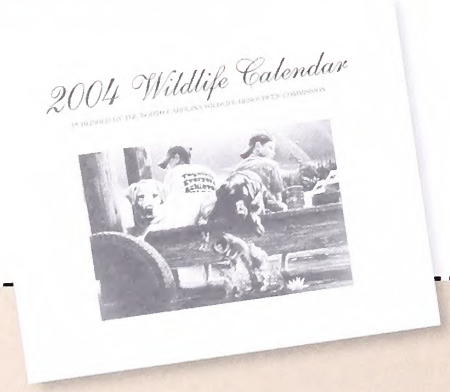
2003 N.C. Migratory Waterfowl Print and Stamp ▶

Buy North Carolina's 21st waterfowl print and stamp, and contribute to wetlands conservation. Wilhelm Goebel's "Traditions at Suggs Mill Pond" depicts the artist and his daughter hunting on a blackwater bay. Overall size: 12" x 14"; image size 6 1/2" x 9". Includes a free museum print of Ron Louque's "Canvasbacks at Whalehead."

No shipping-handling fee or discount applies.

Print and Stamp $145 ITEM CODE **DSP03**
Stamp Only $10 ITEM CODE **DSPS 03**

2004 North Carolina Wildlife Calendar ▼



2003–2004 Federal Duck Print and Stamp ▶

Greater snow geese take wing over the Chincoteague National Wildlife Refuge on the 70th edition of the federal duck stamp. Artist Ron Louque is making signed prints of the stamp available, and we have a limited number. Overall print size: 12" x 14"; image size: 6 1/2" x 9". Includes a free museum print of the artist's "Canvasbacks at Whalehead."

A $9.50 shipping and handling fee applies.
This item not subject to 15% discount.

Print $189 ITEM CODE **FDSP03**
Stamp $16 ITEM CODE **FDSS03**

A Great Gift!

Place your order now. Complete and mail to CALENDAR, N.C. Wildlife Resources Commission, 1710 Mail Service Center, Raleigh, NC 27699-1710. To order by phone, call (919) 662-4377. Order online after September 1 at www.ncwildlife.org, or visit the sales office at 322 Chapanoke Road in Raleigh. (Allow 3 weeks for delivery.)

Complete the form below.

Name _____

Address _____

City/State/Zip _____

Calendar Costs:

1 to 9	$6 each
10 to 25	$5.50 each
26 to 199	$5 each

Please send _____ N.C. Wildlife Calendars at $_____ each. $_____

N.C. residents add 7% sales tax. $_____
(Wholesale orders are exempt from sales tax with a completed Certificate of Resale.)

Total $_____

ALL ORDERS MUST BE PREPAID BY CHECK, MONEY ORDER OR CREDIT CARD.

☐ Check or money order enclosed made payable to **NCWRC.** ($20 charge on returned checks—N.C.G.S. 25-3-512.)

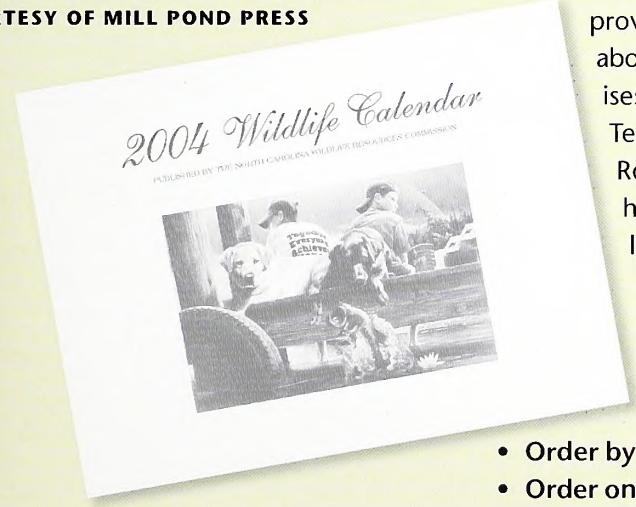
☐ VISA MasterCard # _____ Exp. ____/____

Signature _____ Phone ( )_____

Graceful Reflections

THE 2004 NORTH CAROLINA WILDLIFE CALENDAR

Power and Grace **BY CARL BRENDERS**
COURTESY OF MILL POND PRESS



From season to season, the 2004 North Carolina Wildlife Calendar will provide you with beauty, useful observations and an almanac of facts about wildlife and outdoor activities. The coming year's calendar promises to be one of the best. Al Agnew, Carl Brenders, Kevin Daniel, Terry Isaac and Catherine McClung, along with North Carolina artists Robert Dance, Dempsey Essick, Robert Flowers and Duane Raver, have contributed to a collection of art that honors the diverse wildlife species and landscapes of North Carolina.

Make sure you receive your 2004 calendar by ordering now. There's still time to order several for gifts that present family and friends with something new every month of the year. Calendars are $6 each with discounts for orders of 10 or more.

- **Order by phone with a MasterCard or VISA by calling (919) 662-4377.**
- **Order online with a MasterCard or VISA by visiting www.ncwildlife.org.**
- **Order by mail using the order form on page 40.**

Black Bear Rising

This coastal bruin is one of the growing number of black bears in North Carolina's Mountain and Coastal Plain regions. Story, page 12.

LITHOGRAPHY BY PBM GRAPHICS INC.
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

7:67/2

WILDLIFE IN NORTH CAROLINA

DECEMBER 2003 $2.50

N.C. DOCUMENTS CLEARINGHOUSE

DEC 4 2003

STATE LIBRARY OF NORTH CAROLINA
RALEIGH

Taking a Whiff

by Jim Dean

ILLUSTRATION BY JACKIE PITTMAN

The holiday season is always rich in memories, but almost all of mine are connected to my nose. In the home where I grew up, the fresh smell of pine or fir was the foundation for the multi-layered aromas of baking fruitcake and roasting pecans, along with the more subtle scents of candle wax and oranges. One of the most compelling seasonal smells for me was the hot, metallic odor of an old American Flyer electric train we set up each Christmas. Another that unfailingly recalls past holidays—this will sound odd and may be unique to me—is the smell of Aqua Velva aftershave lotion. I suppose it was a regular gift to someone in my family, but it was always opened and immediately applied. Aqua Velva; instant Christmas.

Of all our senses, it may be our sense of smell that is most directly hot-wired to nostalgia. Those of us who hunt and fish hold dear a vast horde of pleasurable aromas, any one of which can transport us to a happy place. Admittedly, some of these are obscure and undoubtedly reflect eccentric preferences. For example, I doubt there is a hunter alive who can't immediately identify and savor the bananalike aroma of Hoppes No. 9 powder solvent. Long years ago, I suggested that a special young lady of my acquaintance might wish to dab a few drops of Hoppes behind each ear. Had she done so, I believe our lives might have taken a different path. Someday, the perfume industry may recognize that powder solvent is a pheromone, but I suppose it would be an erotic attractant only for those seeking gun nuts as mates.

Hoppes is not the only heady intoxicant for hunters. You can add linseed oil (used to refinish gun stocks), WD-40 and a host of other unguents used to keep weapons clean and free of rust. A just-fired shotgun shell has that wonderful burned-powder aroma, but many hunters would say the most intoxicating smell is of dogs, wet or dry.

One would also not normally associate insect repellents with fond memories or elevated levels of felicity, but that is precisely the feeling I get when I open my grandfather's old tackle box and stick my nose inside. There, I am greeted by the ancient waft of 6-12 repellent and lemony citronella blended subtly with Muriel Senator cigars, fly floatant, old varnish and decomposing Cuttyhunk linen fishing line. I think it must be like a great 1945 Bordeaux, the tannins moderating into recollected fruit that lingers on the nose and makes you glad you've lived long enough to enjoy it at its best. Grandpa's tackle box vintage takes me back to gentle summer afternoons on blackwater millponds under puffy clouds. You can't ask for more than that.

"... many hunters would say the most intoxicating smell is of dogs, wet or dry."

I get a very similar sensation whenever I go into an old boathouse and inhale its musty, faintly fishy dampness, where even the cobwebs and boat cushions seem to add detectable notes. It is much like the smell we associate with rain, not unlike wet dust rising off the pavement after a summer storm.

Even smells that evoke no nostalgia are often pleasant. And while they are not reserved for those of us who hunt and fish, it is certainly true that we are often outside with our nostrils vulnerable, or poking about in places that yield aromas not familiar to everyone (or appreciated, for that matter).

A personal favorite is the distinctly fishy smell of a bed of actively spawning bluegills or shellcrackers. Even some fishermen do not believe you can smell such a thing, but that may merely reflect a lack of experience. Spend enough time fishing for bluegills in the spring when they are spawning, and your nose will acquire a graduate degree in bream bed detection.

Even indoors, the sportsman can access pleasurable smells. While tying flies or making bass bugs, one is assailed by a mix of beeswax, mothballs, liquid cement and the gamy musk of patches of fur or hair combined with moldering emanations from stored rooster necks. Good stuff. Of course, it's not surprising I would like this particular blend, since I acquired a mild addiction to model airplane glue when I was a kid.

Still, of all the smells I associate with my sporting hobbies, one surely stands out. In 1964, I bought a canvas umbrella tent that I still use several times a year. Modern tents are made of synthetics, but nothing smells better than canvas, especially when you're under it. I like to think that in Heaven, where our noses will receive their just rewards for a lifetime of innocent sniffing, we can hope we will all be bivouacked in canvas tents.

Then, just to add the perfect accompaniment, someone will be outside every morning perking coffee and frying bacon and eggs.

Contents

Wildlife in North Carolina

Wildlife in North Carolina is the official educational publication of the North Carolina Wildlife Resources Commission. It is dedicated to the sound conservation of North Carolina's wildlife and other interrelated natural resources and also to the environment we share with them.

December 2003 *Volume 67, Number 12*

Features

page 8

2 The Whereabouts of Waterfowl *written by Chris Powell*
photographed by F. Eugene Hester
If waterfowl populations are up, then where are North Carolina's birds?

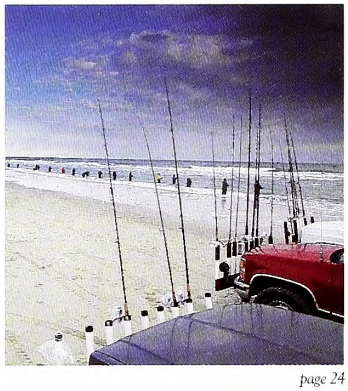
8 We Three Kings *written by Jeff Beane*
photographed by Todd Pusser
Field and fountain, moor and mountain—you might find us there. But you may know more about frankincense and myrrh than you do about North Carolina's three kingsnake species.

14 Uproar *written by Greg Jenkins*
photographed by F. Eugene Hester
Conservation groups make noise about the location of a planned Navy airstrip.

20 Turkey Hunting the Old-time Way *written by Jim Casada*
January will mark the first time in decades that North Carolina has had a cold-weather turkey season.

24 Drama in the Surf *photographed by Kelly Culpepper*
Surfcasters battle the elements in hopes of landing a prize striped bass.

page 14



page 24

Departments

Our Natural Heritage *by Jim Dean* ..... **inside cover**
N.C. WILD Notebook *by Jeff Beane* **28**
Back Porch *by Greg Jenkins* **32**
N.C. WILD Store **37**

page 28

Cover *Tundra swans are among the big bird species that would share air space with Navy jets at the planned outlying landing field near Pocosin Lakes National Wildlife Refuge. Photograph by F. Eugene Hester.*

Wildlife in North Carolina (ISSN 0043-549X) (USPS No. 683-980) is published monthly by the North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188. Periodicals postage paid at Raleigh, N.C., and additional mailing offices. Subscription rates: one year $12, three years $30, lifetime $150. All foreign subscriptions are $28 per year. For subscriptions from foreign countries, payment **only** by U.S. Postal Service money order or cashier's check drawn on a U.S. bank. All orders must be prepaid. Please allow 6 to 8 weeks delivery on new subscriptions and address changes. **POSTMASTER:** Send address changes to Circulation Manager, 1711 Mail Service Center, Raleigh, NC 27699-1711. Address all correspondence regarding subscriptions to Circulation Manager. If you have a problem with your subscription, dial (919) 662-4377. **Articles in *Wildlife in North Carolina* may represent the personal views of authors, and do not imply endorsement by the North Carolina Wildlife Resources Commission.** *Wildlife in North Carolina* is available on audio cassette as a courtesy of volunteer services of the Department of Cultural Resources, Library for the Blind and Physically Handicapped, Raleigh, NC, (919) 733-4376.

Copyright © 2003 by the North Carolina Wildlife Resources Commission. No portion of this magazine may be reproduced by any means without the written consent of *Wildlife in North Carolina*. The N.C. Wildlife Resources Commission is an equal opportunity agency.

the Whereabouts of Waterfowl

If waterfowl populations are up, then where are North Carolina's birds?

written by Chris Powell
photographed by F. Eugene Hester

The perception of mediocre duck hunting in the Currituck and Pamlico sounds is fairly widespread among North Carolina waterfowlers. But what makes this year's shoots perplexing is the fact that breeding ducks—a leading indicator of waterfowl population health—number 36.2 million birds nationally. That's an increase of 16 percent above last year's population and 9 percent above the long-term average, according to the U.S. Fish and Wildlife Service. And, according to midwinter surveys conducted by the Fish and Wildlife Service and the N.C. Wildlife Resources Commission, the number of wintering waterfowl here during 2003 totaled a healthy 325,000. So where are the birds?

The answer is that waterfowl are still coming here; they just aren't frequenting their traditional watering holes. Or if they are, as in the case of diving ducks, they are sitting out in the middle of the sound in big rafts, rather than venturing toward shorelines dotted with blinds. Other ducks, such as puddlers, may be staying more inland in the rivers, creeks and flooded swamps. But believe it or not, numbers of ducks wintering on our coast are not way down. In fact, the 2003 survey was on par with averages dating back to 1955, the earliest recorded waterfowl numbers (see graph, page 5).

Sure, some species such as pintails and migratory Canada geese are in decline, but other species such as tundra swans and green-winged teal are quite strong. So, taken as a whole, waterfowl numbers have remained fairly constant. Then why are many duck hunters spending the season watching seagulls instead of working birds into their decoys? The answer can be summed up in one word: change, said Bob Noffsinger, a migratory bird specialist who has worked for the U.S. Fish and Wildlife Service for 28 years.

"I think some hunters have the idea that waterfowl numbers were up and that they've constantly gone down, but it's been more of an up-and-down thing," he said. "We don't know what the long-term trends are because data only goes back so far. There have been some changes in terms of where the ducks are and who has access."

The Northern shoveler, often called a spoonbill, is one of many duck species that frequent our sounds. A duck hunter (right) picks up decoys after a morning spent in a coastal marsh.

The 1970s saw a big spike for waterfowl in North Carolina, especially puddle ducks. In 1976, the number of wintering puddle and diving ducks surged past the 650,000 mark. Some duck hunters old enough to have experienced that period likely think of those phenomenal shoots as the standard by which modern hunts should be measured. But that doesn't take into consideration the huge ebbs and flows of waterfowl numbers over time. Otto Florschutz, who served on our coast from 1967 to 1993 as a waterfowl biologist for the Wildlife Commission, and later the Fish and Wildlife Service, says he has seen numerous changes that have either enticed or repelled waterfowl. One of the most dramatic was in Currituck Sound.

"Due to whatever reason, the vegetation changed from good submergent duck foods to Eurasian milfoil," Florschutz said. "That happened during my career, and the populations changed. Good submergent vegetation such as widgeon grass, sago pondweed, wild celery and redhead grass—it abounded in Currituck Sound. And then Eurasian milfoil came in during the 1960s, and populations changed, not necessarily for the worse. I can remember some midwinter counts when we had in excess of 100,000 geese up in Currituck. They just loved Eurasian milfoil."

Then migratory Canada geese (not to be confused with resident Canada geese, which are quite abundant) all but stopped visiting North Carolina. During the late 1960s, migrating geese numbers suffered from high hunting pressure down the entire length of the Atlantic Flyway. But once hunting pressure was curtailed and population numbers recovered, many Canadas remained conspicuously absent from Lake Mattamuskeet in Hyde County. In its prime, the lake had been known as the goose capital of the East Coast. Florschutz attributes much of their decline to changing agricultural practices.

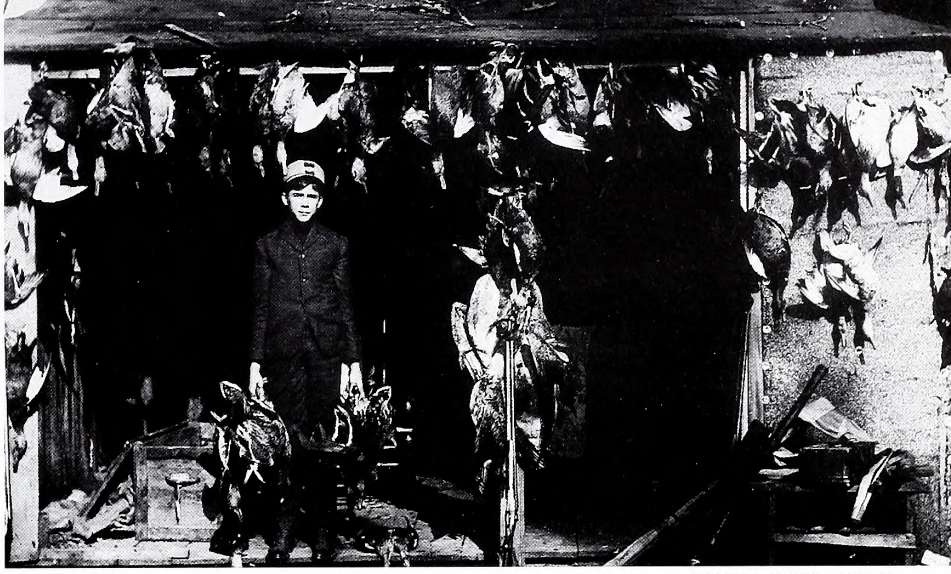
"There was a bad hurricane in the mid-'60s, and it destroyed a lot of corn," Florschutz said. "It left a lot of corn in the field at Mattamuskeet, and the farmers lost some money. So what they did was, they went to earlier varieties of corn. Usually they picked it as the birds were coming down in October, but what they started doing was picking in August and September, and they got dryers so they could pick it wetter. Picked in October, it's cold enough that [leftover kernels] wouldn't sprout. Pick it in September and get some warm rain on it and some warm weather, and it would sprout. And geese eat corn; they don't prefer sprouts. So that changed in North Carolina."

Paralleling that change, Florschutz said, were changes in farming practices along the Eastern Shore of Maryland and in southeastern Pennsylvania. Farmers had been planting primarily tomatoes, potatoes, celery and other vegetables that could be trucked fresh to nearby population centers. However, the proliferation of refrigerated trucks meant that fresh vegetables could be transported year-round from Florida.

This forced the farmers in Maryland and Pennsylvania to go to less labor-intensive crops of corn and soybeans, which geese love. "These were big conversions, and that started short-stopping the geese [around Maryland and Pennsylvania]," Florschutz said, "and they're close to population centers, so [hunters] really hammered the geese. They really went commercial on goose hunting up there."

In the 1970s, the reign of Eurasian milfoil ended (for reasons scientists aren't sure of), eliminating one of the last big incentives for geese and ducks to visit Currituck. Dennis Luszcz, migratory bird coordinator for the Wildlife Commission, said the decline of submerged aquatic vegetation throughout the entire sound system has forced the ducks that do come here to inhabit alternative spots. "Back in the 1970s in Currituck Sound, there was a huge bed of Eurasian milfoil. That is gone; but we still have submerged aquatics, but they're not as abundant. The whole sound used to be just one big mat of vegetation."

Pamlico Sound also has lost a tremendous amount of aquatic vegetation, Luszcz said. That loss could be due to any number of interrelated factors—loss of water-filtering oysters, pollution or dredging. Whatever the cause, the result is turbid water. When light can't penetrate murky water, aquatic vegetation won't grow well. "In Pamlico Sound, Swan Quarter Refuge, for instance, used to hold huge flocks of divers—canvasbacks, scaups, ruddy ducks," Luszcz said. "It seems now that most of our diving ducks are in the Albemarle Sound and Neuse River and some other areas. Canvasbacks have declined in the state to a fraction of their former abundance."



N.C. MUSEUM OF NATURAL SCIENCES

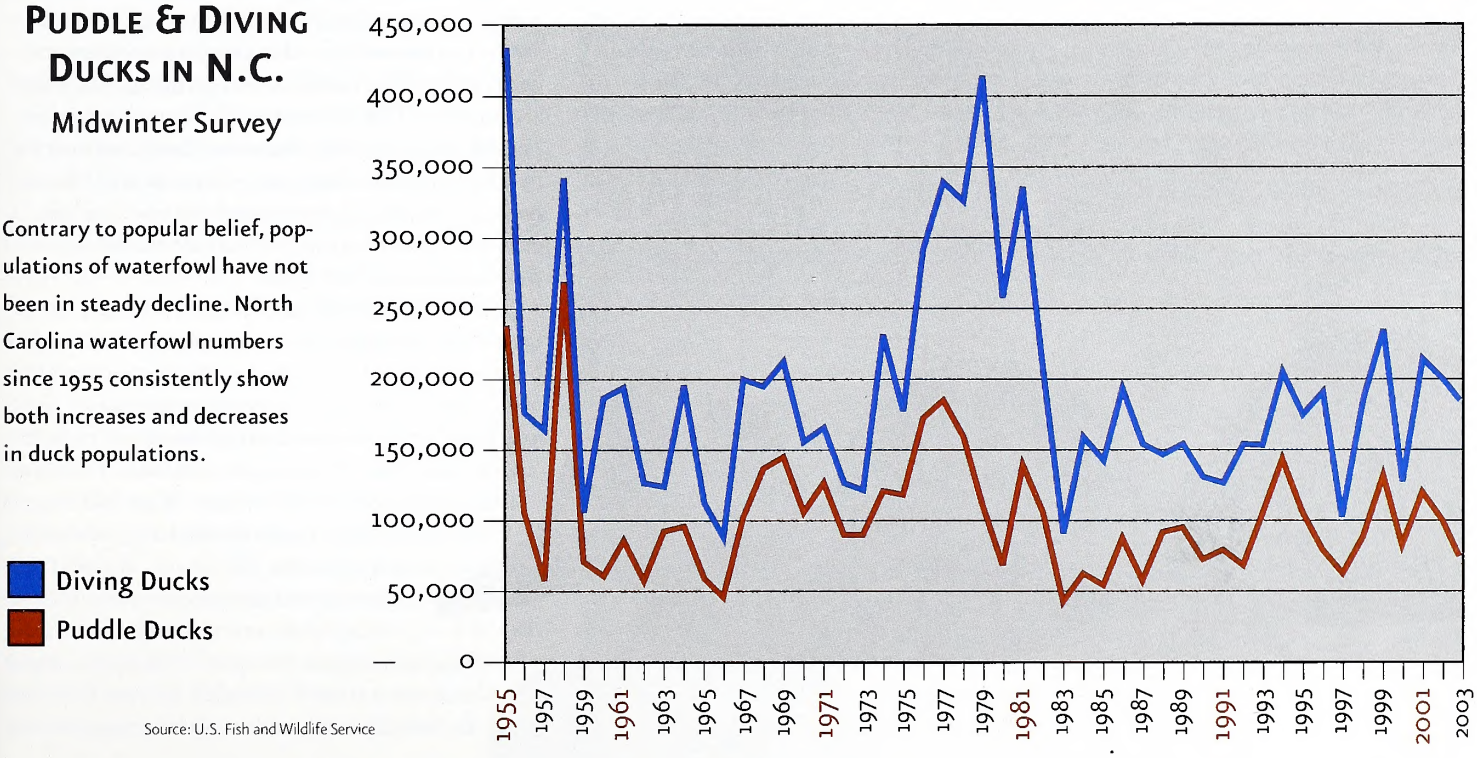
***Taken in 1901,** this photograph was used at expositions and trade fairs to impress out-of-state sportsmen with the abundance of wintering populations of waterfowl along our coast.*

Another factor that has pushed many ducks from their old hangouts has been the dramatic increase of people along our coast. The surge of vacation homes and pleasure boats has reduced the number of solitary areas where waterfowl can roost and feed. "The one thing that has happened really in the last 40 years that I really see that affects waterfowl has been the American public's infatuation with living on and being on the water," Florschutz said. "When I first came here, there were more commercial fishing boats than there were ski boats or motorboats or Jet Skis and such. And it is important to waterfowl to have kind of disturbance-free areas. You could go down any river, such as the Pamlico River, and there would be maybe a dozen houses on it. Now, it's solid houses all the way from Washington down to Belhaven." These intrusions on wildlife will likely be amplified if the U.S.

Puddle & Diving Ducks in N.C.

Midwinter Survey

Contrary to popular belief, populations of waterfowl have not been in steady decline. North Carolina waterfowl numbers since 1955 consistently show both increases and decreases in duck populations.



Source: U.S. Fish and Wildlife Service

Navy's outlying landing field is indeed built in Washington County (see "Uproar," page 14).

Land that is still agricultural along our sounds is increasingly being converted to privately managed waterfowl impoundments. These are basically cornfields that have been diked and flooded. No one knows how many there are on the coast, but Luszcz has observed quite an increase, especially in Hyde County. Before impoundments, puddle ducks—such as pintails, mallards and black ducks—traveled from one natural food source to another, crossing open water. This behavior gave hunters on public waters some opportunity at decoying ducks. Now, the vast majority of puddlers key in on flooded impoundments, with their ample food sources.

MELISSA McGAW

This is not to suggest that private impoundments have been bad for waterfowl populations. Most experts agree that impoundments have been quite beneficial, offering food and rest areas for ducks when the hunting season is closed. And though a few impoundments remain very successful at drawing waterfowl, most of these flooded fields don't produce exceedingly high harvests. One reason is that they have become victims of their own success. "There were a few hundred acres of private impoundments back in the 1980s," Luszcz said. "Now, easily you've got several thousands of acres, literally thousands, and everything is flooded, and a lot of it is corn. It used to be a few stretches in a field, not whole fields flooded. There is an abundance of habitat, and the birds don't have to spend a lot of time anywhere to eat." The little time waterfowl do spend at impoundments increasingly occurs at night, as waterfowl have adapted to daytime hunting.

Warmer winters also have had an effect on our birds. To make long migrations, waterfowl expend tremendous amounts of energy. So if not forced south by extreme weather conditions, ducks and geese are content to stay put, provided a food source is available. This could account for waterfowl short-stopping in the Chesapeake Bay area or migrating through North Carolina during late winter, when most seasons are over.

Habitat and behavioral changes aside, the big question remains: Are we killing too many ducks in North Carolina? Luszcz said he has heard several duck hunters voice concerns about what may be overly generous duck bags and seasons. "We share some of these concerns, particularly as to the effect these bag limits and seasons may be having on some species such as wood ducks," he said. "To date, however, we have not seen any evidence that any adverse effects are the results of these seasons and bag limits."

What may look like a population that is overharvested could very well be a population that is quite healthy but simply not frequenting our part of the world. One of the more challenging aspects of a waterfowl biologist's job is determining where the birds are at any given time. Ducks, geese and swans constantly react to changing circumstances. Waterfowl migrate to satisfy their needs for food and habitat in rapidly changing landscapes. Potholes in Canada and the prairies of the U.S. may be dry one year and wet the next. Thus, breeding success may be strong in a region one year and weak the following year. Food may be abundant in one part of the country or not.

Setting the Table

Local waterfowl managers have little control over the factors that affect how many ducks winter in North Carolina. However, managers can provide good wintering habitat for ducks, which will keep bringing them back.

Good wintering habitat translates into good food and low disturbance. The best long-term strategy to encourage more waterfowl to winter in North Carolina is to bring back submerged aquatic vegetation in our sounds. That will be a long and difficult process, but one well worth the effort. In the short term, we can optimize conditions in areas managed for ducks. Flooded grains are good for providing calories, but they don't provide all the birds' nutritional needs. Public and private impoundment managers should include native wetland plants in their management. Moist-soil management produces a variety of good native seed-producing plants that meet ducks' nutritional requirements. Moist-soil management takes know-how and work, but it is a key to providing optimal wintering habitat.

In addition, low disturbance is essential for ducks. Time spent on impoundments, whether hunting or looking, must be minimized throughout the wintering period. The most successful managers hunt no more than twice a week and limit the hours of those hunts to shorter periods in the mornings or evenings. A good mix of moist-soil plants and grain crops on managed impoundments, along with low disturbance, sets a table that ducks find hard to refuse.

For assistance, contact N.C. Partners, a partnership of the N.C. Wildlife Resources Commission, the Natural Resources Conservation Service, Ducks Unlimited and the U.S. Fish and Wildlife Service. This organization assists private landowners with developing, restoring and enhancing wetlands and waterfowl habitat. On the Web: manteowildlife.fws.gov/ncpartners.html.

—Bob Noffsinger, migratory bird specialist for the U.S. Fish and Wildlife Service

The weather could be warm or frigid. Hunting pressure may decrease in developing areas or increase in recently impounded locations. So biologists are constantly aiming regulations at highly mobile targets.

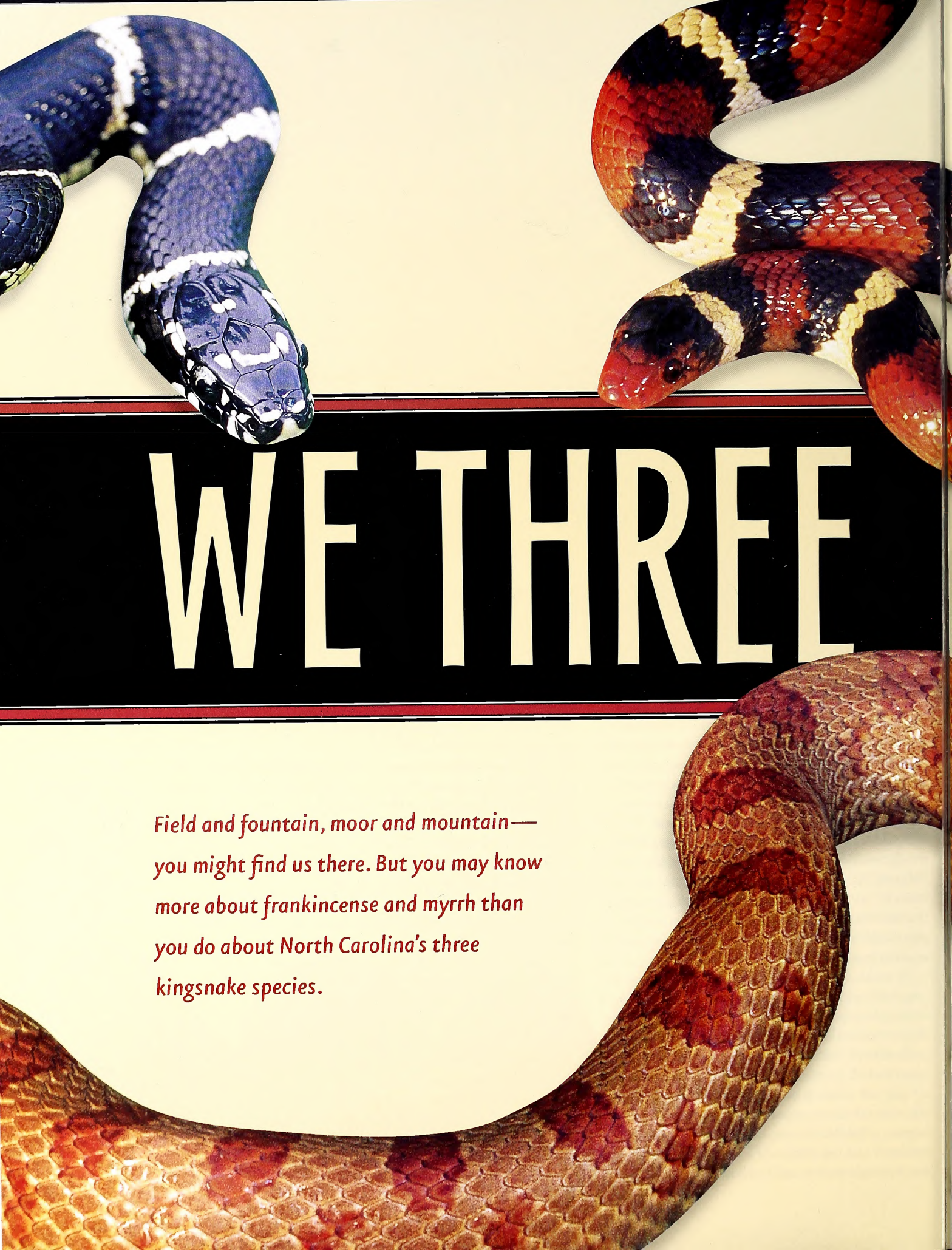
The problem is further compounded by the fact that our waterfowl come from different areas of the U.S. and Canada, with considerable mixing among the flocks. With this limited information, the U.S. Fish and Wildlife Service is forced to issue season limits for entire flyways, though the possibility exists that the harvest of birds from a particular breeding area could be too high, even though their population as a whole is quite strong.

To tackle this problem, biologists have begun tagging ducks with satellite transmitters that allow the birds to be tracked from their breeding grounds to their wintering locations. These tags are small backpack devices that are strapped onto the backs of waterfowl. Relatively new technology, the backpacks are just now allowing biologists to determine specifically where ducks are going and returning to. Michael Legare, a Wildlife Service biologist at Lake Mattamuskeet, said the Atlantic Flyway Council, which recommends seasons and bag limits to the U.S. Fish and Wildlife Service, is starting to think about managing by region instead of by flyway.

"Now, they [Atlantic Flyway Council representatives] are talking about dividing regulations up, not just for the Atlantic Flyway, but for the northern extent of the flyway and the southern extent of the flyway," Legare said. "Say here in North Carolina, if we are getting more of our birds from a western part [of the continent] than the birds that are going through Maryland or New Jersey or wherever they come from, and the western birds are having a bad breeding season, it's not really good for us in the South to be hitting them as hard."

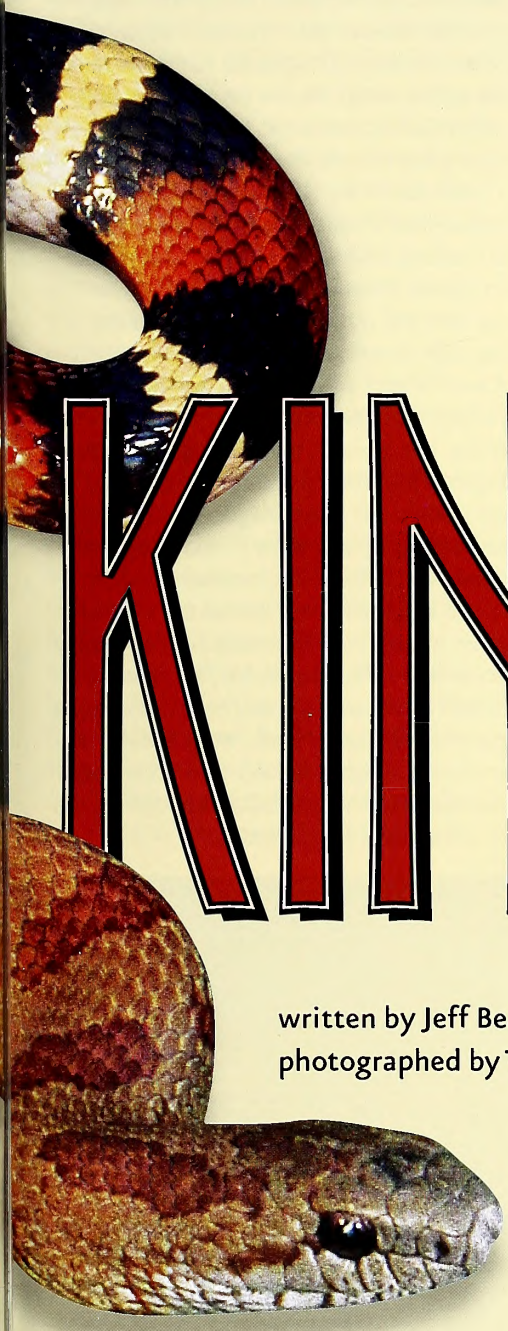
Changes in waterfowl management, changes in habitat, changes in behavior: What does all this mean? The good news is that waterfowl have adapted to most of these situations rather than bypass us altogether. In our lifetimes, the skies will likely never darken with migrating flocks like they did during the early 20th century. Nonetheless, healthy populations of ducks, geese and swans continue to call North Carolina home. Duck hunters, like the waterfowl they pursue, need to adapt by better identifying ducks on the wing, taking drakes instead of hens and—most important—hunting where the ducks are. ⊠

***A flock of mallards** and teal launches into the winter sky. A Canada goose (facing page) is fitted with a backpack satellite transmitter that allows biologists to monitor its movements from nesting area to wintering ground.*



WE THREE

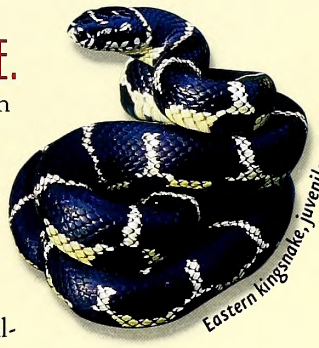
Field and fountain, moor and mountain—
you might find us there. But you may know
more about frankincense and myrrh than
you do about North Carolina's three
kingsnake species.



KINGS

written by Jeff Beane
photographed by Todd Pusser

YOU HUMANS DO LOVE TO ELABORATE.


Eastern kingsnake, juvenile

Take the story of the Three Wise Men. Three Eastern kings—Balthasar, Gaspar and Melchior—rode camels across the desert, following a super-bright star nearly to the Mediterranean Sea. Yet nowhere is it recorded that there were three of them, or what their names were, or that they were kings, or that they rode camels or how far they traveled. Where did the details of the story come from? Embellishment, you might call it—a trademark of your species.

There are three other kings you've told tales about—North Carolina's three kingsnake species. You've heard the old legend that animals communicate at Christmastide? Well, we'd like to take the occasion to set the record straight on a few things.

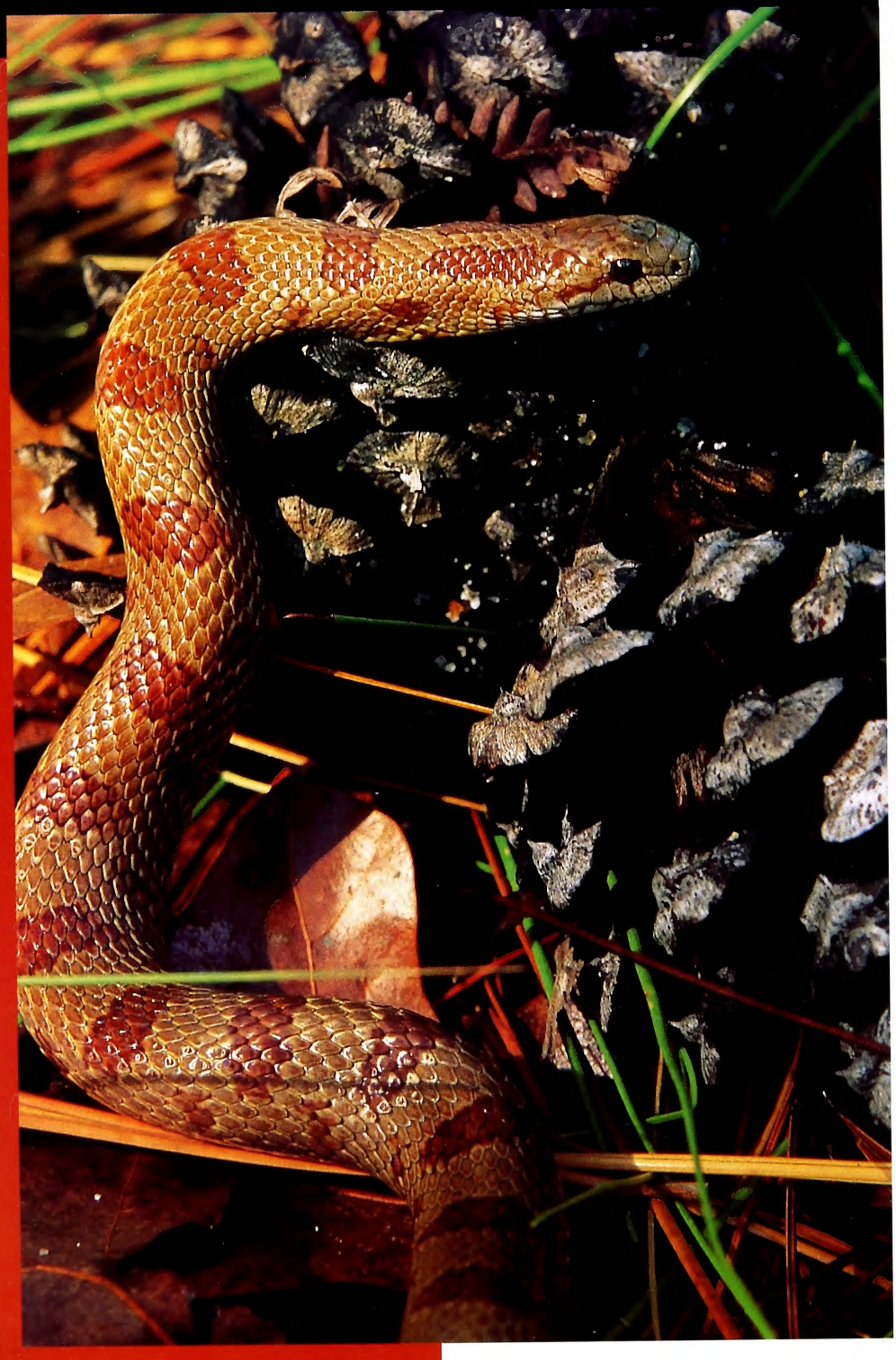
KINGSNAKES RULE! Your scientists place us in the large family Colubridae, which includes all of your state's—and most of the world's—nonvenomous snakes. Our genus name, *Lampropeltis*, honors our shiny scales (from *lampros*, meaning "radiant," and *pelta*, meaning "small shield"). Sounds suitably regal, doesn't it? But our common name, king, comes from your belief that we can vanquish venomous snakes. There's *some* truth in that. We eat other snakes, including venomous ones. But we're not their enemies, and we don't go out of our way to kill them. If we're hungry, any snake—venomous or not—is simply a meal (and one fit for a king, at that). We'll even eat our own species on occasion. If that sounds crazy, we must remind you that cannibalism is practiced by many species, including your own.

In fact, many snakes—racers, coachwhips, coral snakes and copperheads, to name a few—eat other snakes, but for some reason we kingsnakes get all the credit. If you're long and thin, don't handle utensils well and must swallow your food whole, it makes sense for your meals also to be long and thin. If you've wondered *how* we kill venomous snakes, well, we've been eating them for several thousand years. Along the way we developed considerable immunity to their venom (as did opossums and some other animals). They seldom try to bite us anyway. Typically, they hide their heads and try to bop us on the nose with a loop of their bodies, hoping we'll leave them alone. When we're ready to eat, though, we kill prey by constriction: We grab, wrap and squeeze with our strong coils until the prey suffocates. We eat lots of other things besides snakes, such as lizards, small mammals, birds, amphibians and turtle eggs.

Contrary to some of your stories, we're not always gentle and friendly. We may bite you if you handle or otherwise harass us. Our bite won't hurt any more than a briar scratch, but we hope that it startles you into leaving us be. Like many snakes, when frightened we may rapidly vibrate our tails and release a nasty-smelling musk from our cloacal glands. In fact, we're a lot like other snakes.

Facing page, clockwise from top left: Eastern, scarlet and mole kingsnakes are the subject of numerous legends and myths.

MEET NORTH CAROLINA'S THREE KINGS ▷

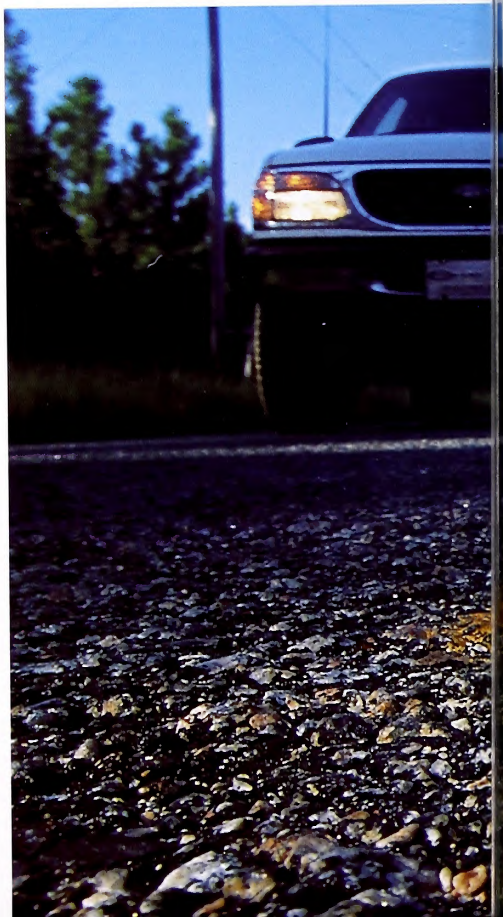


Mole kingsnakes, which can exhibit strong brown or reddish coloring, spend most of their time underground.

MOLE KINGSNAKE

Lampropeltis calligaster

Though my species is the most common of kingsnakes in some parts of North Carolina, it's probably the least familiar to you. That's partly because we spend much time underground, often in the tunnels of moles or other mammals. Despite the name, we rarely eat moles, except for the occasional young one; an adult mole is too large and powerful for any but the very largest of us. I do relish a baby pine vole, along with other small rodents and shrews, which I'm pretty good at catching underground. I also have a taste for lizards and small snakes. My kind average between 2 and 3 feet in length, but a big male of my species might grow to nearly 4 feet. When I was younger, I had a blotched pattern that made me look a bit like a corn snake, but it seems to be fading with age. Especially in the Piedmont, old males of my species may lose their pattern entirely, resulting in a plain, shiny brown snake with a yellowish belly; you sometimes call them brown kingsnakes. My species name, *calligaster*, means "beautiful stomach," presumably because one Richard Harlan, who named us in 1827, admired our pretty belly markings. In parts of the Coastal Plain, we're sometimes erythristic (bright reddish)—an unfortunate phenomenon that has led to our exploitation by commercial pet collectors.



EASTERN KINGSNAKE

Lampropeltis getula

When y'all say "kingsnake," we're the ones you usually mean. You might call us chain king, chain snake, thunder snake or swamp wamper. I'd sure like to know what a wamper is. The species name you gave us—*getula*—is even crazier. It refers to the Getulians, a Moroccan tribe. Near as I can figure, Linnaeus, the Swedish botanist who gave us that name in 1766, likened our chainlike markings to the pattern on some fabric woven by the Getulians. Makes a good story, anyway.

We're the largest of kingsnakes, occasionally exceeding 6 feet in length but averaging between 3 and 5 feet. We live in most parts of North Carolina except for the highest mountains, but are most common in the Coastal Plain and forested parts of the Piedmont.

In some places on the Outer Banks, we occur in a form that you call the Outer Banks kingsnake. Unfortunately, these attractive individuals have become especially prized by humans who illegally collect animals for the pet trade. The pet trade, along with the beach tourist traffic, has so reduced populations that you've seen fit to add our Outer Banks populations to your state list of species of "Special Concern." Our mainland populations are also declining, as your scientists have noticed.

Many among your species consider me a "good" snake because you think I kill or drive off "bad" venomous snakes. Thanks anyway, but the way I see it, a copperhead is not at fault because it happened to develop a powerful enzyme that helps it live. Nor am I "good" because I find copperheads edible. And you've heard that releasing kingsnakes in your yard will make your venomous snakes disappear? Just think about that one: If your yard is good habitat for us, we'll already be

***An Eastern kingsnake** constricts and consumes an Eastern hognose snake. Numbers of both species have been reduced by habitat loss, automobile traffic and the pet trade.*

. . . WHAT WE'RE LOOKING FOR IN THOSE BARNS IS MICE, NOT MILK. . . . YOUR COW WENT DRY FOR SOME OTHER REASON.

there, in precisely the numbers the habitat can support. If it's also good habitat for copperheads (or whatever), they will be there too, in just the numbers that it can support. Predators rarely eliminate their prey; predator and prey strike a balance. Moreover, like many animals, we're territorial, and if you relocate us, we'll probably go back home or die trying.

Incidentally, despite another of your tales, I am incapable of causing thunder. You tell *me* how that got started.

SCARLET KINGSNAKE/ EASTERN MILK SNAKE

Lampropeltis triangulum

Mine is a highly variable species—a species complex, actually, composed of about two dozen subspecies, ranging from Canada to Argentina. A fellow named Lacépède coined our species name, *triangulum*, based on the triangular marking on an Eastern milk snake's head. In North Carolina, we come in two basic forms, so different that you once considered us separate species. Your ideas about species can get pretty complicated.

You see, in the mountains and foothills we occur in a form that you call the Eastern milk snake (*L. t. triangulum*), because someone got the notion that we sneak into barns and milk cows. I could give you several reasons why that couldn't happen. Imagine the difficulty we'd have reaching a cow's udders, let alone forcing milk from them. No cow would endure our tiny, needle-sharp teeth—plus, our stomachs are totally unsuitable for digesting milk. Facts can ruin a good story, but what we're looking for in those barns is mice, not milk. We also eat small snakes and lizards. Your cow went dry for some other reason.

Eastern milk snakes average about 2 to 3 feet in length. I myself have a blotched pattern, somewhat like that of a young rat snake or a drab corn snake, not much like the copperheads you sometimes confuse us with. Our young have a more colorful, vivid, often reddish pattern.

In forested areas of the Coastal Plain, and in some areas of the Piedmont where forests remain, we occur in a smaller form that you call the scarlet kingsnake (*L. t. elapsoides*). Scarlet kings rarely reach 24 inches in length, but they compensate with color. They somewhat resemble one of your holiday candy canes. Some of you believe they mimic the venomous coral snake (*elapsoides* essentially means "like a coral snake"), but it's not quite that simple. Mimicry is a complex topic, and your species can oversimplify things (as in "kingsnakes cause thunder").

In the northeastern Coastal Plain, we occur in a form that's best described as intermediate: the larger size and pattern of the milk snake, with the colors and behavior of the scarlet king. You once regarded this form as a separate subspecies or even a full species. Now you generally consider it an intergrading population and call it "Coastal Plain milk snake." As you wish.

Scarlet kingsnakes are specialists, adapted for eating skinks, those little armored lizards that other animals send back to the chef. We'll also eat other lizards and tiny snakes such as earth snakes and crowned snakes. Occasionally, we might raid a nest of newborn mice. We're secretive and more nocturnal than the other kingsnakes, spending much time underground, inside logs or under loose bark on logs and stumps.

Though often considered rare, we're still fairly common in a few places, and not terribly difficult to find at the right time of year, if you don't mind destroying our microhabitat. We'd rather you didn't. We're mostly a bigwoods species, most common in longleaf pine forests. So when forests fall for agriculture or development, we are one of the first reptiles to disappear. And why, might you ask, would a small, secretive snake require large, forested tracts, especially when it survives on skinks, which live on most any urban lot? That's for us to know and you to find out. We kings have our secrets. ⊠

The Eastern milk snake (below) also occurs in a brighter, smaller form known as the scarlet kingsnake (right).

Conservation groups make noise about the location of a planned Navy airstrip.

UPROAR

WRITTEN BY GREG JENKINS
PHOTOGRAPHED BY F. EUGENE HESTER

Honking, quacking and chirping are the noises you expect to hear at Pocosin Lakes National Wildlife Refuge. Its 113,000 acres of scrubby swampland, pine forest, agricultural fields and natural lakes host hundreds of thousands of migratory waterfowl each winter. Ducks, snow geese, tundra swans and Canada geese converge on the lakes and forage in recently harvested farm fields. The flurry of activity during the winter roost can often resemble a giant-sized version of a child's snow globe: Shake it up, and the sky is filled with large, white birds taking flight. It's an amazing sight—a Discovery Channel program waiting to be filmed.

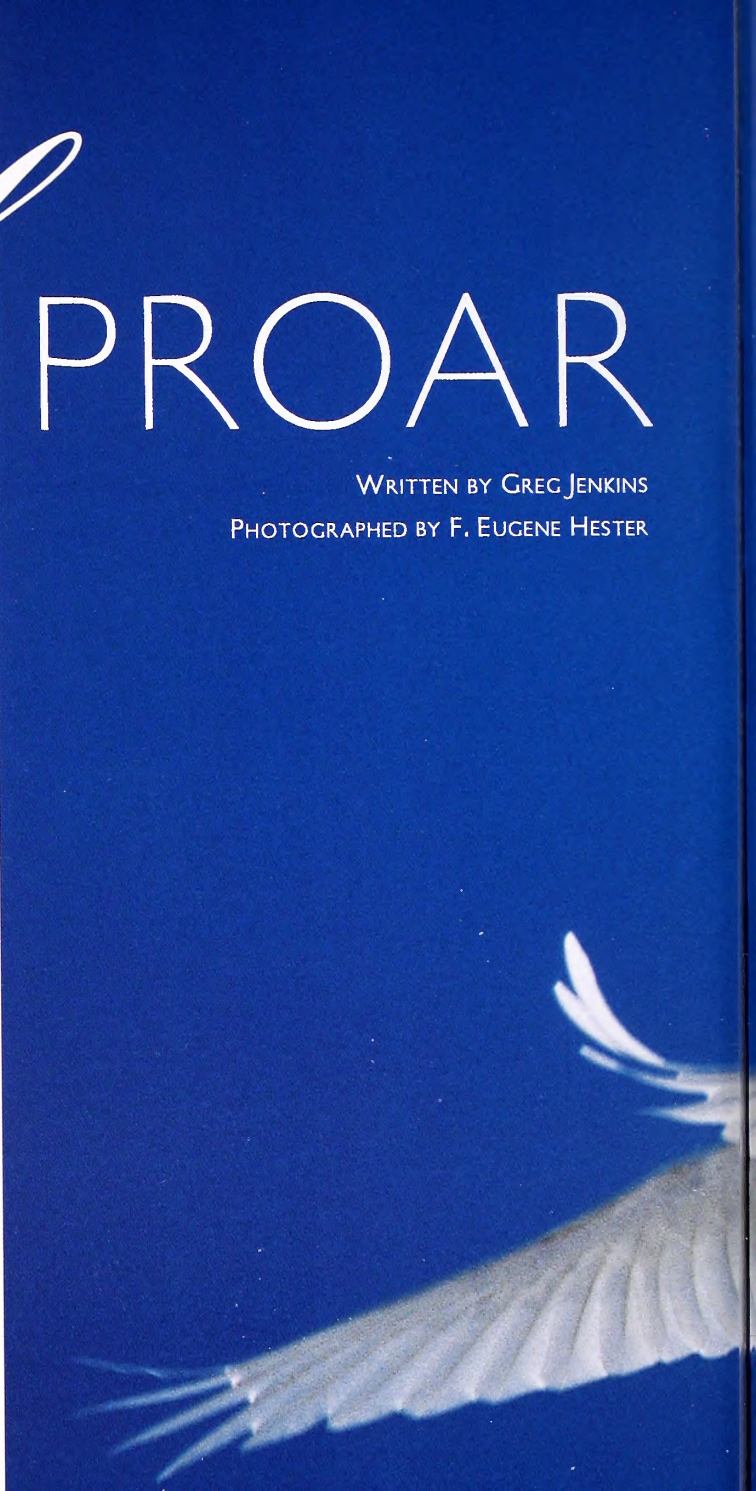
But if the U.S. Navy has its way, in a few years the dominant sound heard in the skies near Pocosin Lakes will be the roar of F/A-18 Super Hornet fighter jets. Despite the fervent protests of state and national conservation groups, state and local governments, the U.S. Fish and Wildlife Service and residents of the Albemarle region, the Navy announced its intention to build an outlying landing field (OLF) in southern Washington County near the Beaufort County line. The facility will allow Super Hornets based in Virginia Beach and Havelock to practice aircraft carrier landings on land.

Opponents argue that an OLF site near the wildlife refuge would threaten wintering waterfowl by eliminating habitat and foraging areas; depress the local economy through loss of tax and tourism revenues; and endanger Navy pilots practicing touch-and-go landings at the facility. The landing field's holding pattern would come within 2/10 of a mile of the refuge, where 20-pound birds could readily damage $60 million aircraft. The Navy is confident that it can mitigate the habitat loss, economic decline and pilot risk to acceptable levels, based on experiences at other air bases located near areas rich in wildlife.

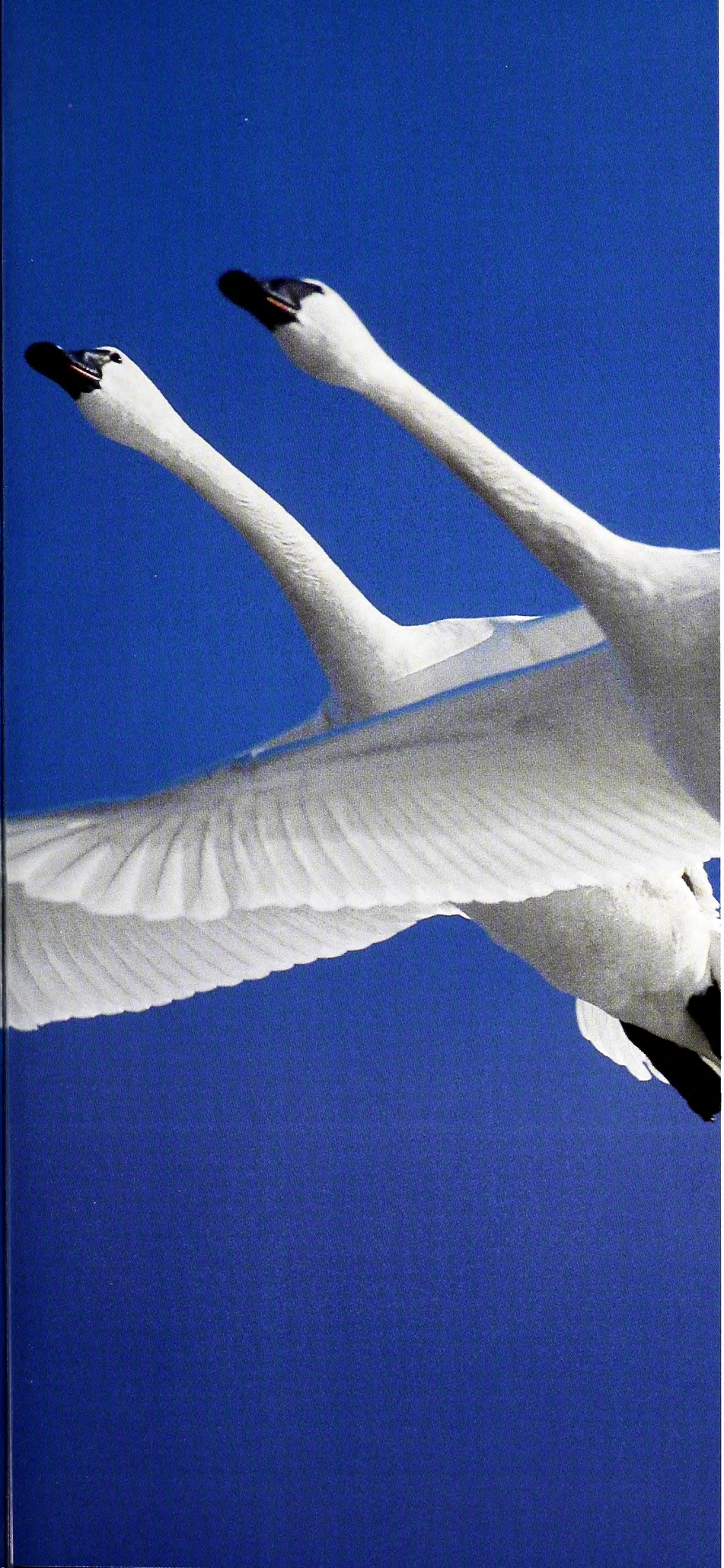
There are few hard facts to support either side in the controversy; the fight centers on what-if scenarios. However, that has neither stopped the Navy from moving forward with steely resolve nor deterred organizations opposing the OLF from responding with equal zeal.

"We tried to find truly the best site from an operational and an environmental criteria standpoint, and we think we did," said Dan Cecchini, the Navy's project manager in charge of completing the environmental impact statement (EIS) for the siting of the Super Hornets on the East Coast. "We think the Washington County site has some advantages over the other sites, and that's why we listed it as our preferred."

"This landing field is the biggest conservation story in the history of the state," said Joe Albea, host of TV's "Carolina Outdoor Journal" and a leader in the fight to prevent the field from being built. "It's just not right, and we're not going to have it. We're going to stop it."



Five months of the year, *tundra swans (above) and snow geese (right) dominate the skies above the site chosen for a Navy practice field to be used by Super Hornet fighter jets.*



Why Washington County?

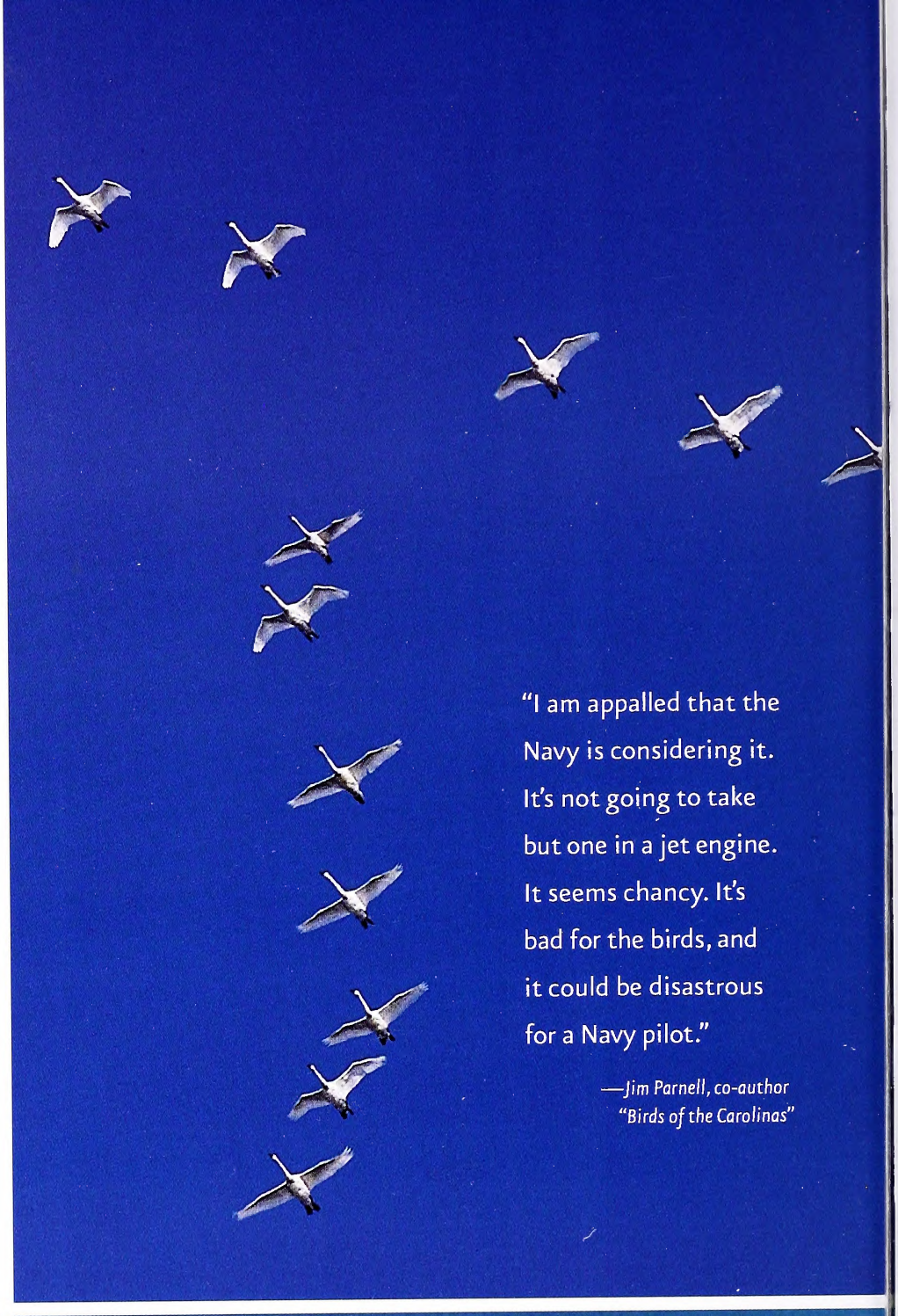
On Sept. 10 of this year, the Navy announced that it had selected a rural, coastal location that is almost perfect for its purposes. Geographically, it is halfway between Naval Air Station Oceana in the Tidewater area of Virginia and Marine Corps Air Station Cherry Point in Craven County. Ten squadrons of 12 Super Hornets apiece would be split between the two bases. To replicate a night landing on a carrier in the open ocean, the OLF must be in an area that is largely undeveloped. Washington County, population 13,700, meets that requirement. The Navy plans to purchase 30,000 acres and relocate 74 homes. The field itself requires less than 3,000 acres for the runway and surrounding buildings, but the noise buffer zone around the OLF is about 10 times as large. Even if it paid slightly more than market value and assisted with relocation expenses, the Navy would spend relatively little on land acquisition. And because the county's population density is low, few human neighbors would be bothered by the noise created by the OLF's operations.

"We looked at a bunch of different sites," Cecchini said. "We've evaluated the merits of all the different sites and tried to put our blinders on, not paying any attention to political or state boundaries or county boundaries."

In human terms, the OLF's impact on Washington County is easy to define. The Navy's acquisition of the land will take thousands of acres of prime farmland out of private ownership—farmers might be allowed to lease some fields inside the noise buffer—removing $200,000 in annual tax revenues from the books in Washington and Beaufort counties. The landing field would provide about 50 jobs, but because very few personnel would be based at the OLF, Navy fliers and their families won't move into the area to live and spend money. Many area residents have complained that locating the landing field there means the Albemarle region gets all the impact and none of the benefit.

Bothering the Birds

The big question is not whether the Navy's avian neighbors 5 miles away at the refuge would be bothered, but how much. Pocosin Lakes is home to more than 100,000 wintering waterfowl each year, but the refuge's main management focus and claim to fame are its big, white birds. From October through March, as many as 90,000 tundra swans and snow



"I am appalled that the Navy is considering it. It's not going to take but one in a jet engine. It seems chancy. It's bad for the birds, and it could be disastrous for a Navy pilot."

—*Jim Parnell, co-author "Birds of the Carolinas"*

U.S. NAVY

geese roost on Pungo and New lakes within the refuge and on Phelps Lake immediately adjacent to the refuge. Tundra swans are docile and difficult to scare, but snow geese are flighty and easy to spook. Biologists with the N.C. Wildlife Resources Commission have reported that once a flock of snow geese scatters, it can take as long as an hour for them to settle down. With the irregular schedule of operations at the OLF—flights at night, days with no flights, days with hundreds of landings—it could be difficult for the birds to become habituated to the jet noise.

"We've seen them, time and time again, flare up in a big flock for no apparent reason, and then a plane comes over a few seconds later," said Howard Phillips, the refuge manager at Pocosin Lakes. "That plane disturbed them or got them going up into the air when it was far away. I've seen eagles blow them off in one big mass—they're all over the place—and I know the planes are going to do the same thing."

The Navy says it is used to dealing with large flocks of snow geese at installations such as Naval Air Station Whidbey Island in Washington state, which appears to be the base that is most similar to the Washington County OLF site. Navy experts are not worried about dealing with the skittish critters. The EIS suggests that because military flights pass over the refuge occasionally and the numbers of waterfowl there are still high, the birds become somewhat habituated to the noise. The report also states that average sound levels at Pocosin Lakes would be 49 decibels, which is quieter than conversational speech at 1 foot away. The Navy's formula averages all noise during a typical 24-hour period, taking into account the 99 percent of the time there is peace and quiet and factoring in the brief periods of jet noise. Still, the level of average quiet does not assuage the fears of those who monitor the behavior of the snow geese on a daily basis. "I will be amazed if snow geese habituate to jet noise," said Wendy Stanton, a U.S. Fish and Wildlife Service biologist at Pocosin Lakes. "They're so wary."

The OLF's effects on wildlife populations are difficult to predict, but only the Navy's scientists and wildlife managers claim there will be little or no harm. The Wildlife Commission, in a letter to the secretary of the Navy, insists that any habitat loss associated with building an OLF would indeed be deleterious. If tundra swans and snow geese are forced to fly further from the refuge to find food, they will use more energy to obtain their daily calories. That, in turn, could damage the birds' health and reproductive ability.

"Following the loss of prime foraging areas, waterfowl would 1) be forced into suboptimal habitat, 2) spend more time in preferred areas, but with more crowding, and 3) use more energy," stated the commission's letter. "These responses would potentially have negative consequences on populations."

A significant decline in the populations of geese and swans could mean a corresponding drop in ecotourism and hunting. Phillips is convinced that the number of visitors to Pocosin Lakes will fall if the birds don't show up like they have for centuries. Then there's the noise factor. A flyover in the OLF's holding pattern has been estimated at anywhere between 90 and 100 decibels, which would equate to a power tool or a subway train. Phillips thinks that hunters will not put up with more than a few instances of jet noise scaring away a big deer or bear. Likewise, bird-watchers probably will not take kindly to fighter planes causing them to miss a glimpse of an easily startled species.

***Wildlife managers fear** that the awesome spectacle of flocking birds over Pocosin Lakes refuge would be diminished if landing-field operations reduce bird populations.*

The Navy Stands Alone

Wildlife organizations have uniformly condemned the Washington County OLF site. The U.S. Fish and Wildlife Service, which manages Pocosin Lakes, and the Wildlife Commission, which manages nearby Scuppernong, Lantern Acres and Van Swamp game lands, informed the Navy that its OLF plans conflict with the habitat restoration and expansion goals the two governmental agencies have worked toward for years. Private groups such as Ducks Unlimited, the Atlantic Flyway Council, the National Audubon Society, The Nature Conservancy and the N.C. Natural Resources Group have all expressed their desire that the Navy find an alternate site.

These groups differ with the findings of the Navy's environmental impact study. Ducks Unlimited claims that Super Hornet noise would be disruptive to large numbers of waterfowl. The Atlantic Flyway Council, an organization of the directors of state and provincial wildlife departments along East Coast migratory routes, wrote that the mix of birds and aircraft at the same altitudes was reason to disqualify the Washington County site. The Nature Conservancy says that the OLF site is "entirely unsuitable based on potential impacts to conservation areas." And the state chapter of Audubon is working with the Southern Environmental Law Center to craft a lawsuit barring the Navy from building there. "The only people saying it works are Navy employees," said Chris Canfield, executive director of Audubon North Carolina. "Their case would be stronger if they had corroboration from another agency."

The state's political leaders have entered the fray. U.S. Sen. John Edwards came out against the Washington County OLF site, asking for a congressional hearing into the matter, and U.S. Sen. Elizabeth Dole met with Albemarle region leaders and the acting secretary of the Navy, Hansford Johnson, in an attempt to negotiate better terms for the deal. Gov. Mike Easley also attempted to bargain, saying that the Navy's plan to base two squadrons of Super Hornets at Cherry Point is not enough to offset the economic loss in the coastal counties to the

***Even one or two** tundra swans hitting a $60 million Super Hornet could cause serious damage and perhaps even a crash.*

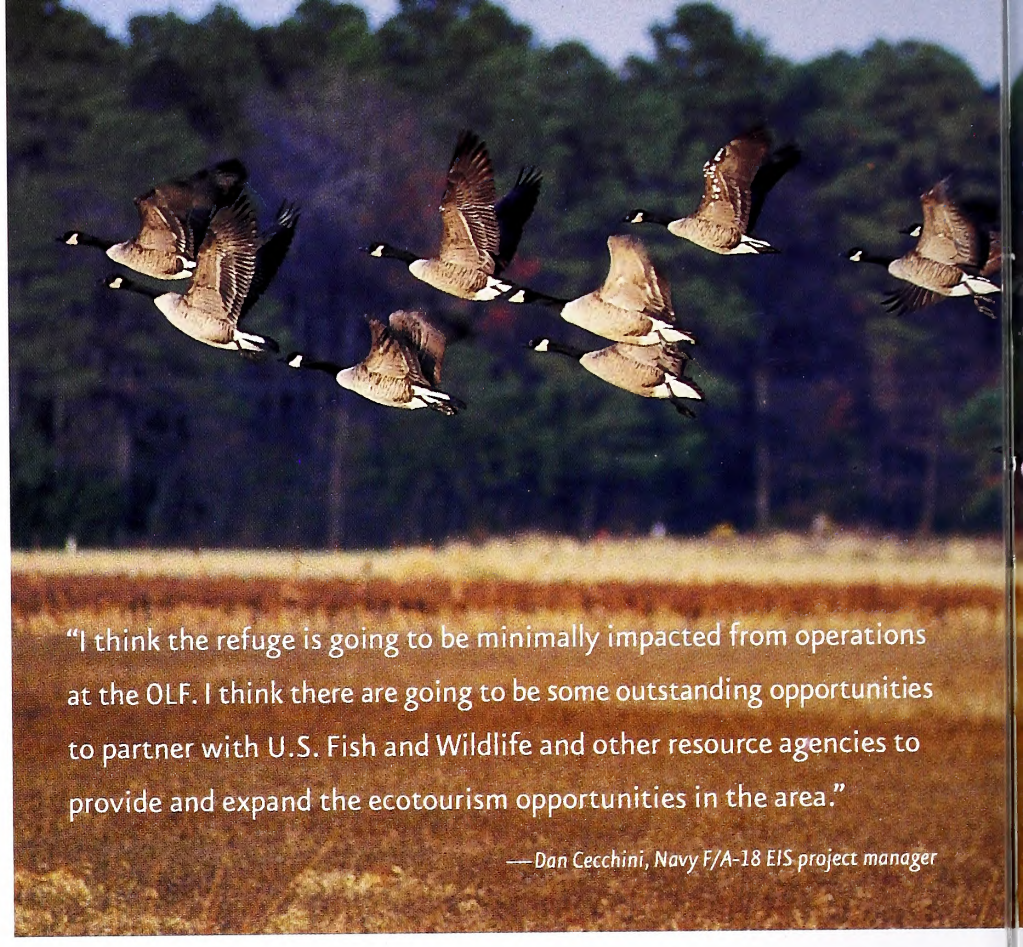
GREG JENKINS

north. Easley wrote that he would prefer either to have no OLF at all or to host no fewer than five squadrons in return for allowing the OLF somewhere other than in Washington County.

What Next?

Phillips is afraid he will have to shift his staff's management efforts to other species if the populations of tundra swans and snow geese decline because of OLF operations. On the state level, the Wildlife Commission could shift its management and enforcement efforts to other areas of the coast if the predicted declines in wildlife populations and ecotourism occur.

It appears that the next phase of the OLF struggle will take place in a courtroom. The Audubon lawsuit will challenge the Navy's EIS by saying the study does not meet National Environmental Policy Act standards. Audubon North Carolina's Canfield, a former Air Force public affairs officer, said the severe risk of bird strikes should have been a deal-breaker when it came to selecting a site for the OLF. The geographic location might be perfect, he said, but with a huge population of big birds accustomed to flying long distances to feed, the site poses a danger for birds and pilots that is unacceptable. "It's like having a new design for an aircraft, except the tail falls off when you turn left," Canfield said. "Then you say, 'We're just going to change the way we fly so we don't have to turn left.' Ridiculous. It's got all the factors except one big one. I thought they would take the location off the table when they knew the facts. Wildlife people don't always agree, but we're in lockstep on this issue." ⊠



"I think the refuge is going to be minimally impacted from operations at the OLF. I think there are going to be some outstanding opportunities to partner with U.S. Fish and Wildlife and other resource agencies to provide and expand the ecotourism opportunities in the area."

—Dan Cecchini, Navy F/A-18 EIS project manager

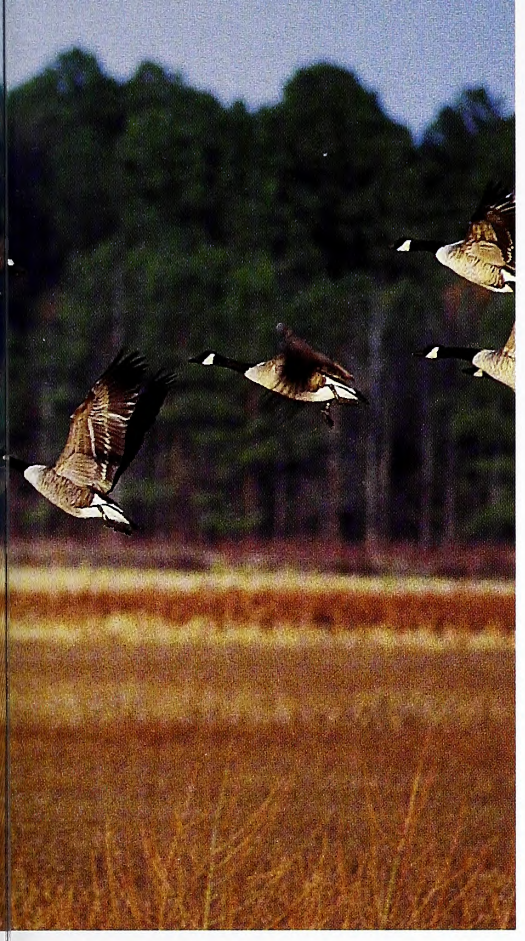
How to Avoid Hitting Your Neighbors

If the OLF is built, the Navy's greatest day-to-day challenge will be bird avoidance. The new Super Hornets are tough aircraft—one of them hit a flock of 17 pelicans recently and was able to land, be repaired and return to service—but all it takes is one bird strike at a certain angle to shatter an F/A-18's canopy or severely damage its engine. To lessen the possibility of bird strikes, the control tower will need hard data on the best and worst times to fly. To provide that information, the Navy would need to monitor the movement patterns of birds from the refuge and surrounding areas for a couple of migratory seasons while the OLF is being built.

Matt Klope, a wildlife biologist and director of the Navy's Bird/Animal Strike Hazard program, said that the OLF ground crew must consistently see the birds and warn the pilots to prevent accidents. To accomplish that, the Navy will put its faith in extraordinary radar technology that detects flocks of birds in flight for miles in every direction. Field radar operators might even be given direct radio access to pilots to immediately instruct them to change flight paths to avoid a bird strike. Of course, even the best radar and communication cannot prevent an occasional impact with a bird, especially because frequent night operations at the OLF mean pilots won't be able to see the birds. "All I can say is it could happen in Anywhere, USA," Klope said.

Find Out More About The OLF

www.efaircraft.ene.com ■ www.albemarlecommunity.net ■ www.safetycenter.navy.mil/aviation/operations/bash/default.htm



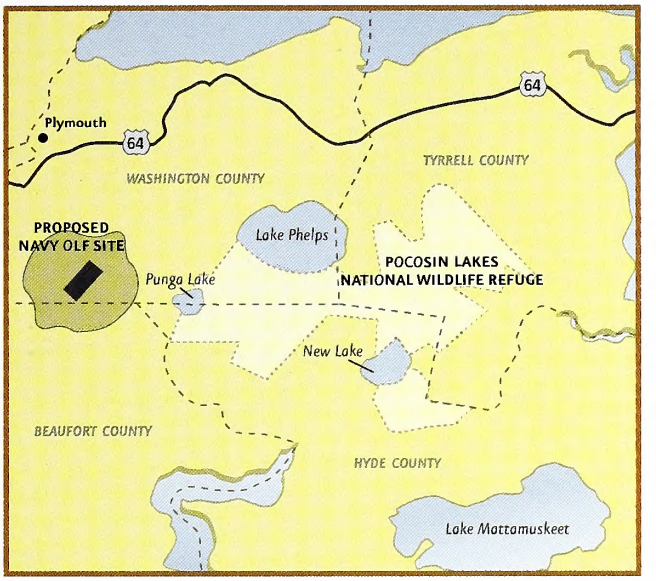
***Washington County** residents protest the outlying landing field, and migratory Canada geese might go somewhere else if the disturbance is too great.*

"The [Navy's] written decision suggests that the bird strike risk at the Washington County field site is similar to other sites in the area and that a standard Bird Aircraft Strike Hazard Plan can be developed to mitigate this concern. This conclusion is erroneous . . . the use of radar for real-time bird avoidance is still in development and not currently part of naval air operations anywhere in the world."

—Ron Merritt, former Air Force BASH chief and radar surveyor of Washington County OLF site

Bird-Heavy Refuges Near Military Air Bases

GRAPHICS BY MARSHA TILLETT



Site: Pocosin Lakes NWR, Washington, Tyrrell and Hyde counties, N.C., 5 miles from proposed Navy OLF

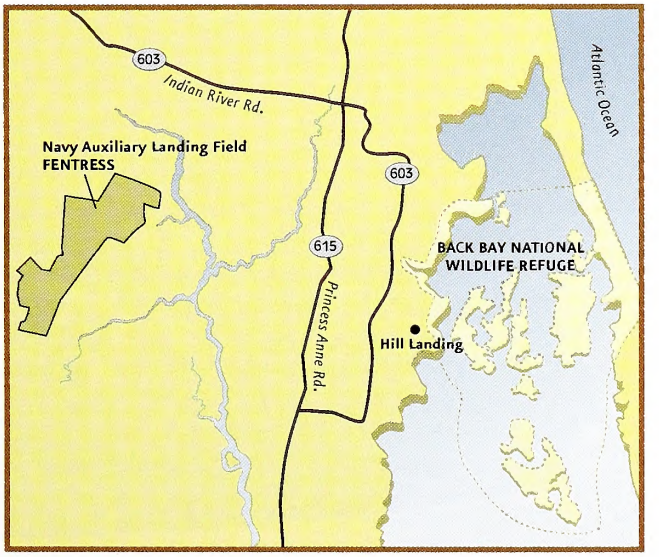
Birds/movements: 90,000 tundra swans and snow geese; fly as many as 20 miles one way each day to forage

Aircraft/movements: F/A-18 Super Hornet jets; fly within 5 miles of refuge, holding pattern 2/10 of a mile from refuge at approx. 800 feet altitude

Site: Skagit Wildlife Area, Conway, Wash., 10 miles from NAS Whidbey Island

Birds/movements: 70,000 snow geese; feed mainly on refuge

Aircraft/movements: EA-6B Prowler jets, various prop planes and large jet troop transports; landing pattern and maneuvers over refuge at approx. 1,000 feet altitude



Site: Back Bay NWR, Virginia Beach, Va., 10 miles from NALF Fentress

Birds/movements: 10,000 snow geese; generally stay within 5 miles of refuge

Aircraft/movements: F-14 Tomcats and F/A-18 Hornet jets from NAS Oceana (7 miles north) practice carrier landings at Fentress, flying within 3 miles of refuge

Sources: U.S. Navy, U.S. Fish and Wildlife Service, *National Geographic* magazine, Washington Department of Fish and Wildlife, The Nature Conservancy, Mapquest.com

Turkey Hunting
THE OLD-TIME WAY

January will mark the first time in decades that North Carolina has had a cold-weather turkey season. WRITTEN BY JIM CASADA

An old adage has it that you can't know where you are going if you don't know where you've been. When applied to turkey hunting, most Tar Heel turkey hunters don't know where they've been. But that's not their fault, because it has been decades since North Carolina hunters have enjoyed the opportunity to participate in the sport's roots. The reason is simple. Traditional turkey hunting took place in the late fall and winter months, and for many years the only turkey hunting season in North Carolina has occurred in the springtime.

Today, virtually everyone agrees that the decision to move from fall and winter hunting to a season held during the mating period was a part of the wild turkey's salvation. When fall/winter hunting was still the norm, the wild turkey was in desperate trouble not only in North Carolina but across the country. Turkeys were gone from many areas where America's big game bird had once existed in appreciable numbers. Where they survived, wild turkeys lived only in the most remote, protected regions.

It needs to be noted that it was not fall hunting alone that led to this sad state of affairs. A host of other factors, including market hunting, ridiculously high seasonal limits (in some states ranging as high as 25 birds annually), rampant baiting, poaching and poor to nonexistent management practices, also entered into the picture.

THE COMEBACK. Fortunately, things changed when biologists discovered that trap-and-transfer stocking combined with gobbler-only hunting in the spring mating season could reverse the wild turkey's serious dilemma. Today, its return represents one of the finest conservation sagas in the history of American wildlife management.

North Carolina has been an integral part of that story. A large number of turkey biologists, backed by the National Wild Turkey Federation, did their part, and the wild turkey began to trot down the comeback trail. Restoration is, for all practical purposes, an accomplished fact statewide (Wilson County is the only county without a spring season). It has been so successful that January 2004 will offer the first opportunity in decades for Tar Heel hunters to pursue turkeys at a time other than spring.

A TENTATIVE FOOTSTEP INTO THE PAST. In 2003, the N.C. Wildlife Resources Commission approved a winter either-sex season on private lands in Alleghany, Ashe, Caswell, Granville, Person, Rockingham, Stokes, Surry and Watauga counties. The dates will be Jan. 12–17, and hunters will be allowed to kill one bird. If they do so, they will be able to take only one gobbler (instead of two) the following spring. A draw hunt will offer limited opportunities to hunt on the Caswell Game Land. Use of dogs, a favored technique of old-time hunters, will be permitted. The regulations reflect some of the lessons learned in neighboring Virginia, where fall hunting has been available for decades. Specifically, the timing avoids deer season, when legal baiting for deer could potentially lead to illegal baiting for turkeys.

TIPS FOR TAKING TURKEYS IN THE WINTER. The time-tested strategy most commonly used in winter hunts involves locating a flock of turkeys (usually hens and their young of the year), scattering them and then calling them back to the area where they were separated. Young turkeys have a strong flocking instinct, and when separated they become quite vocal in trying to regroup with other birds.

The idea is to break up the flock as completely as possible, using secondary scatters if birds fly in the same direction. Then you build a blind at the site the flock just vacated. You want to be well hidden but have open areas for good shots. Depending on whether they have been pressured by previous scatters, flocks may begin to reassemble almost immediately or wait as long as an hour. In the case of bachelor groups of old gobblers, the wait can be appreciably longer.

Once the turkeys begin "talking," you need to get in the conversation immediately. Unlike in spring hunting, it is practically impossible to call too much to flocks of hens and their young in winter hunting. Use yelps, clucks and kee-kee-runs liberally. One tried-and-true approach is to mimic whatever you hear.

JIM CASADA

***A turkey track** in the snow (facing page) is a sure sign that a flock is nearby.*

JIM CASADA (TOP); MASLOWSKI PHOTOGRAPHY

A FOCUS ON TURKEY FOODS

Wild turkeys have an incredibly diverse diet, but the hunter who can pinpoint primary sources of food during the winter season greatly increases the likelihood of close encounters of the desirable kind. Some scouting can be of considerable assistance, because extensive scratching and other types of recent signs indicate that turkeys are using a given area with regularity. If you find such signs, try to figure out what the birds are eating. Among the favored fall/winter foods are acorns, beechnuts, dogwood berries, sparkleberries and any kinds of insects the birds might be able to locate.

MASLOWSKI PHOTOGRAPHY

WINTER LONGBEARDS

Most of the turkeys killed in fall and winter hunting are young of the year, but it is possible to harvest mature gobblers. They have little if any of the flocking instincts of young birds, although they do tend to travel in bachelor groups. Sparse calling, with an emphasis on coarse clucks and the occasional gobble, works best. Keep in mind that if you break up a bunch of gobblers, it is possible they will reassemble almost immediately and with minimal vocalization. Accordingly, rather than taking time to build a blind, set up at once and be on your toes. At most, cluck once or twice in a 15-minute period. If nothing happens, build a blind and be prepared to wait a long time, maybe hours, and even then the likelihood of success isn't high. Henry Edwards Davis, author of "The American Wild Turkey," put it best: "Any fool can kill a lovelorn old gobbler in the mating season, but the mark of a true turkey hunter is the ability to fairly call and cleanly kill one in the fall."

This standard approach to winter turkey hunting lends itself nicely to two or three hunters calling together. When turkeys are talking in all directions as they draw near, multiple callers sound as if several turkeys have already gotten back together. Also, winter is a wonderful time to introduce youngsters to the sport. They will hear far more of the turkey's vocabulary than is the case in spring hunting. They can be encouraged to get in on the calling without worrying about a false note or two ending the entire affair. And the likelihood of success is a good bit higher than in springtime.

Scattering birds may seem simple, but it definitely is not. It takes skill to get close enough to a flock to send it into frightened flight to all points of the compass, as opposed to having it run off or fly away as a group. For that matter, you have to locate a flock before you can even think about scattering it, so let's discuss the details of finding and flushing turkeys.

Locating turkeys can be done by trial and error or by the walk-and-call technique spring hunters call "trolling." However, a more dependable method requires doing your homework before the season opens. Look for favored roosting and feeding sites and daily travel routes. The ability to read signs—scratchings, droppings, dusting areas, tracks and indications of roosting spots—helps a great deal. And, a wet overnight snow can be a great ally. Venture out the next morning and look for tracks. You can learn a great deal about turkeys and what they do by following a flock for an hour or two. (Try not to disturb them in the preseason.)

There's no better time to achieve a really good flush, one that sends birds winging in every direction, than just before dawn or shortly after dusk. In the predawn scenario, walk through an area where you think turkeys have roosted and raise as much ruckus as possible. Yelling or slapping trees with a folded-up newspaper can help. Should you pull off a scatter, build a blind and wait for the birds to start calling. If you do not hear anything in half an hour, initiate the calling on your own. If you see birds fly up to roost at dusk, wait until the light has faded before trying to scatter them. Otherwise, all the turkeys will fly toward the last remaining bit of light in the west. Once you have scattered them from the roost, go ahead and build a blind, but make sure you can

find your way back to it well before daylight the next morning.

Another method of flushing requires a tag-team effort by two or more hunters. Should you spot turkeys in an open field or pasture, try to maneuver into positions on opposite sides of the area without being seen. Then on a prearranged signal, perhaps a shot into the air or a loud yell, charge the flock like a bunch of Civil War buffs reenacting the Battle of Bull Run.

For the lone hunter (and the sport is one that in many ways lends itself not only to solitude but to the solitary approach), stealth and plenty of scheming offer the greatest likelihood of good scatters once turkeys are on the ground. In the hilly or mountainous terrain where North Carolina winter hunting takes place, one effective approach is to follow a ridgeline while making sure to keep a few feet below its crest. Ease to the top from time to time and check for the sights and sounds of feeding turkeys. Provided the forest understory is reasonably dry, a flock will sound almost exactly like a human walking through the woods.

Should you spot turkeys, try to figure out their general direction of travel. You can then decide whether to cut them off at the pass, ambushlike, or position yourself close enough to scatter them effectively without being seen. One other possibility, and it has worked for me more than once, is to try calling the entire flock. More often than not they will simply answer and go on about their business, but on occasion the entire group decides to check out the lonesome bird they think they hear.

As in most any type of hunting, there's no substitute for firsthand experience, and it should be ongoing. Or, as the dean of American campers and longtime North Carolina resident Horace Kephart put it, "In the school of the outdoors there is no graduation day." Come January, those who try their hand at winter turkey hunting in the Old North State will find themselves enrolled in a new school on an equal footing, because most will have had no previous experience with this type of hunting. It differs markedly from the hunts in spring, but the excitement of the quest is just as intense. It's a marvelous chance to travel back to experience a sporting world we almost lost. ⊠

Editor's Note: Any thoughts on this story? E-mail margaret.martin@ncwildlife.org.

MATT LINDER

HUNTING WITH DOGS

Should you hunt with a capable turkey dog, a genuine treat lies in the offing. A canine companion trained to deal with turkeys will cover far more ground than humans possibly can. A dog can also trail turkeys once it hits a scent and get far better scatters when it finds the flock. Ideally, a turkey dog trails silently until it actually sees birds, and once this happens it barks even as they take wing in all directions. Hunters then go to the point where the barking occurred, build a blind and secure the dog.

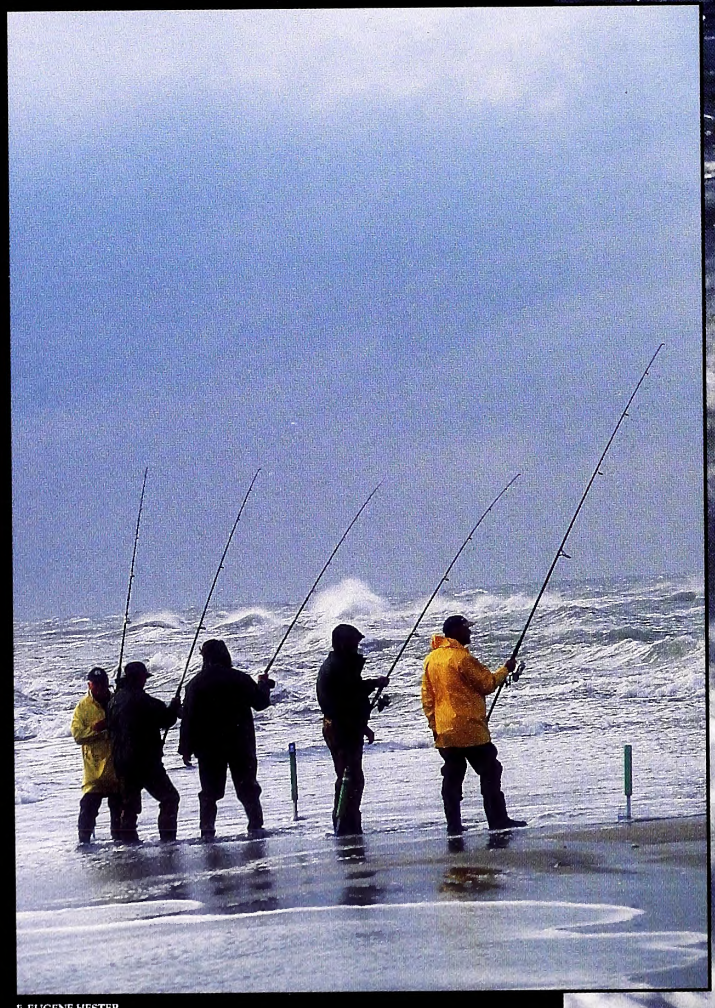
SCOTTY LOVETT

MATT LINDER

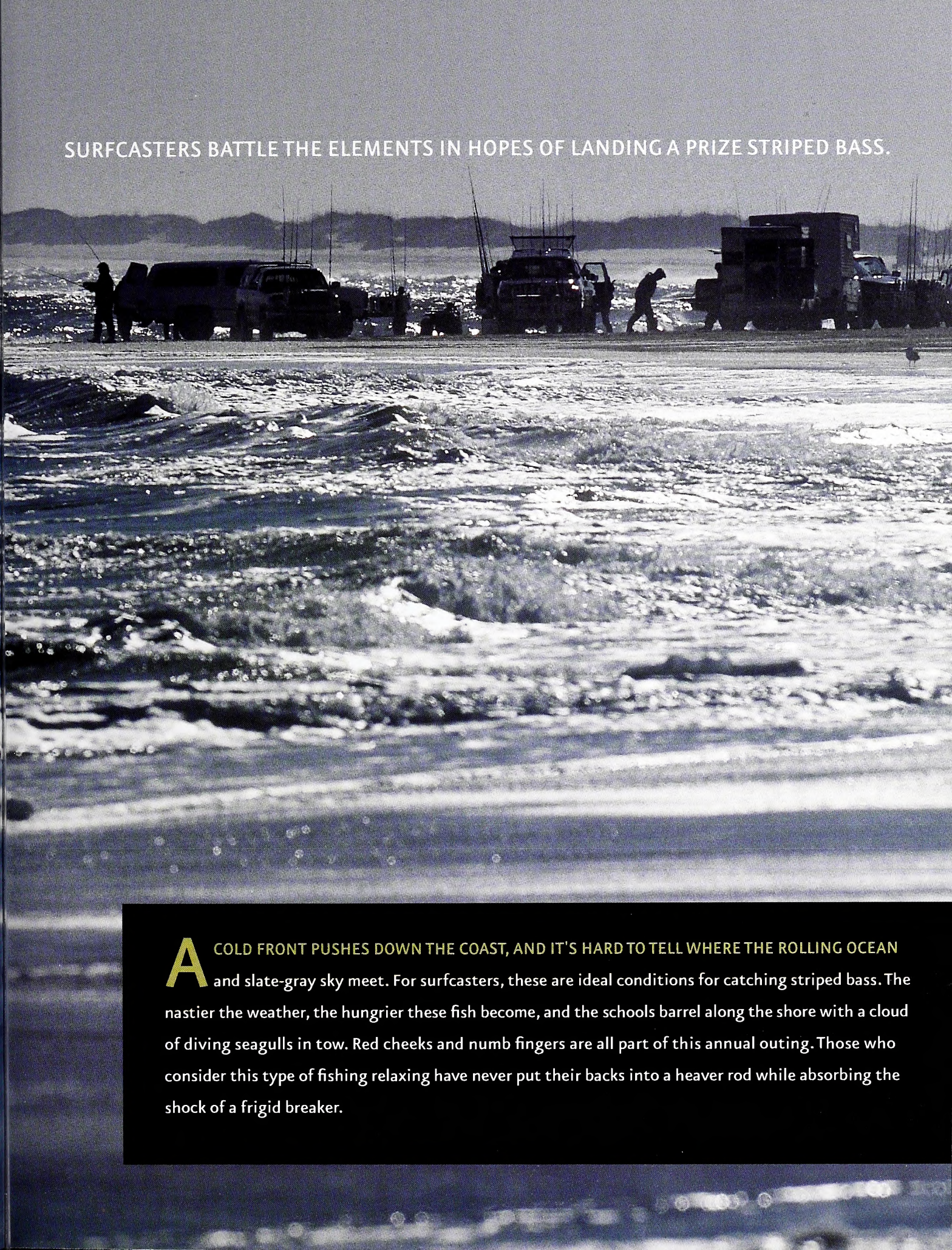
***After scattering a flock** of turkeys, concealed hunters should make liberal use of assembly calls such as yelps, clucks and kee-kee-runs to try to draw the turkeys back in.*

DRAMA IN THE *Surf*

PHOTOGRAPHED BY KELLY CULPEPPER



F. EUGENE HESTER



SURFCASTERS BATTLE THE ELEMENTS IN HOPES OF LANDING A PRIZE STRIPED BASS.

A COLD FRONT PUSHES DOWN THE COAST, AND IT'S HARD TO TELL WHERE THE ROLLING OCEAN and slate-gray sky meet. For surfcasters, these are ideal conditions for catching striped bass. The nastier the weather, the hungrier these fish become, and the schools barrel along the shore with a cloud of diving seagulls in tow. Red cheeks and numb fingers are all part of this annual outing. Those who consider this type of fishing relaxing have never put their backs into a heaver rod while absorbing the shock of a frigid breaker.

A TEMPORARY CAMP GROWS AT THE EDGE OF THE ATLANTIC
WHERE SALTY NOMADS CAST TO THE SURF.

They stalk our wetlands like sentinels, adding a grace and beauty all their own. Once, we almost lost them. Let's take a closer look at

Herons and Egrets

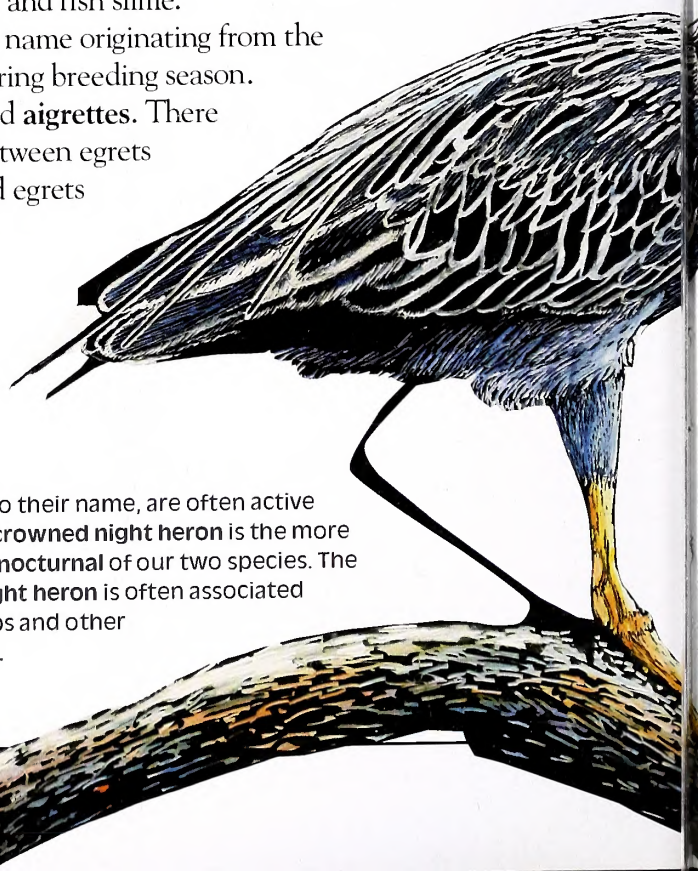
written by Jeff Beane / illustrated by Patricia Savage
nature activity by Anne M. Runyon

LONG, TALL WADERS

Herons belong to the order Ciconiiformes, which they share with storks, ibises and flamingos. They make up the family Ardeidae. There are more than 60 species worldwide, and they live nearly everywhere except for the northernmost regions of North America and Eurasia. Herons are predators, adapted for wading in shallow water and catching fish and other small animals. They have long, slender legs, long necks and long, sharp bills, which they use to snatch prey from the water or grass. They also have a special type of feather, called **powder down**, that is never shed but grows continually and frays into a powder used to protect the other feathers from water and fish slime.

Certain herons are called egrets, a name originating from the large, showy feathers they develop during breeding season. These special plumes were once called **aigrettes**. There is no specific biological difference between egrets and other herons, but species called egrets are usually white.

The **tricolored heron** is seldom seen inland. It was never hunted for its feathers, and is one of the Southeast's most common herons.



Night herons, true to their name, are often active at night. The **black-crowned night heron** is the more common and more **nocturnal** of our two species. The **yellow-crowned night heron** is often associated with cypress swamps and other freshwater habitats.

The **great blue heron** ranges throughout the state in winter, and mostly in the Coastal Plain and eastern Piedmont during summer.

Bitterns are shy, secretive herons. They have shorter legs and stockier bodies than most other species, and are usually **cryptically** colored.

Herons are often erroneously called cranes, but are not related to them. Cranes (as well as storks, ibises and other wading birds) fly with their necks straight out. Herons fold their necks into an S-shape when they fly. They flap their broad, rounded wings slowly, with their legs trailing straight out behind their short tails.

In most heron species, males and females look alike. Most species breed in large colonies called **rookeries** or **heronries**. Most build large, bulky platform nests, usually in trees or shrub thickets, and lay from three to six usually greenish, bluish or whitish eggs. Males and females share nesting duties.

The **green heron**, one of our smallest herons, ranges statewide during the warmer months, but is uncommon in winter.

The great egret is a permanent resident along our coast, but often wanders inland during late summer.

A Perilous Past

The beautiful breeding plumes of some herons and egrets nearly led to their extinction. In the late 1800s, plumes became extremely fashionable as decorations for women's hats. Many thousands of egrets were killed only for their plumes, which brought high prices in the **millinery** trade. In 1903, egret feathers were worth twice their weight in gold. Some breeding colonies were completely destroyed, and several species were approaching extinction. Hardest hit were the great egret and snowy egret. Fortunately, many people did not wish to see herons **extirpated** and protested the slaughter. The National Audubon Society and its British counterpart, the Royal Society for the Protection of Birds, formed as a result. Their efforts eventually resulted in protective legislation for all herons, and later, for all migratory birds.

Read and Find Out

- *Herons and Egrets of the World: A Photographic Journey* by James A Hancock, Academic Press, 1999.
- *Birds of the Carolinas* by Eloise F. Potter, James F. Parnell and Robert P. Teulings, University of North Carolina Press, 1986.
- *Field Guide to the Birds of North America*, National Geographic, 2002.
- *The Sibley Guide to Birds* by David Allen Sibley, Alfred A. Knopf, 2000.

In *Wildlife in North Carolina*:

- "A Tale of Two Continents" by David S. Lee, December 1999.

What Does It Mean?

powder down: specialized feathers, found in herons and some other birds, which are not molted but grow continuously, their tips disintegrating into a powder that helps waterproof and protect the other feathers

aigrette: a tuft of large, showy plumes, often made from the tail feathers of an egret

bitterns: any of several usually secretive, stout-bodied herons with shorter legs and necks and more camouflaged plumage than other herons

cryptically: in a hidden or camouflaged fashion

rookeries: places where animals gather in large colonies to nest or give birth; so named for rooks (crowlike European birds that breed in such colonies)

heronries: breeding colonies of herons and egrets

nocturnal: active at night

millinery: the business of making women's hats or headdresses

extirpated: wiped out; driven to extinction within a given area

It's WILD!

Project WILD activities for teachers and students that correlate to this topic include:

Adaptation Artistry teaches students to identify, describe and evaluate the advantages and importance of bird adaptations.

Rare Bird Eggs for Sale teaches students to identify reasons for and consequences of collecting wildlife and wildlife products.

Bitterns hide in tall marsh vegetation and are seldom seen. The American bittern has a remarkable booming voice unlike that of any other bird. Its unique call has given rise to such names as "stake driver," "thunder pumper" and "belcher squelcher." The least bittern is our smallest heron. Though not rare, it is so good at hiding that it is seldom encountered.

Get Outside

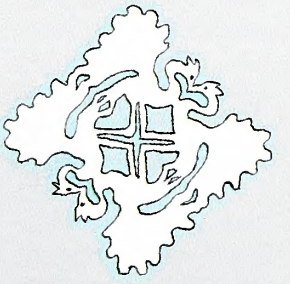
Go heron watching. See herons at our large coastal refuges such as Pea Island, Mattamuskeet, Alligator River, Pocosin Lakes and Swan Quarter national wildlife refuges; Cape Hatteras and Cape Lookout national seashores; Hammocks Beach, Fort Macon and Carolina Beach state parks; and Fort Fisher State Recreational Area. Virtually any body of water may be visited by herons, and even if you live in the mountains, you can see great blue herons during winter, green herons during breeding season, and visitors like great egrets during migration and late summer post-breeding dispersal. The National Audubon Society's Coastal Island Sanctuaries protect several heron breeding colonies, including Brunswick County's Battery Island, which supports the state's largest nesting colony of wading birds. Access is extremely limited to prevent disturbance, but you can watch herons flying to and from Battery Island from the waterfront at Southport.

Get WILD

WILD workshops, offered by the N.C. Wildlife Resources Commission, provide teachers with opportunities for continuing education. For a current listing of WILD workshops, connect to the commission's Web site at **www.ncwildlife.org** and click the link for **education/workshops**.

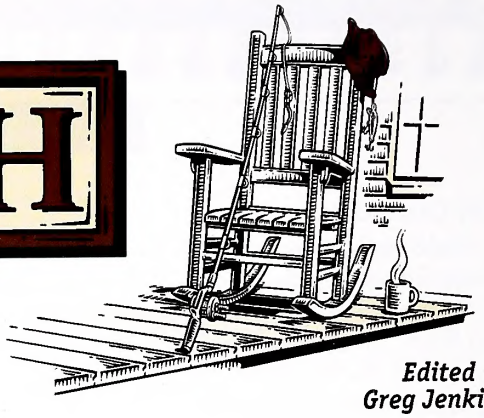
Snowy Egret Snowflake

1. Copy the art at 140% (B&W is fine).
2. Neatly cut out the square box along the black lines.
3. Fold the square in half.
4. Fold in half again, so that the egret is on top.
5. Carefully cut away the blue areas and unfold your Snowy Egret Snowflake.



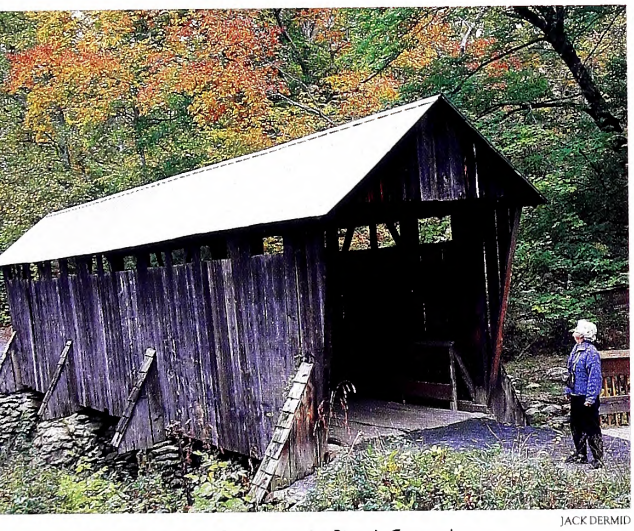
BACK PORCH

News and Wildlife Notes



Edited by Greg Jenkins

Zoo to Help Rebuild Historic Bridge



JACK DERMID

***After 92 years of service,** the Pisgah Covered Bridge was destroyed by a flash flood in August.*

The N.C. Zoo will help rebuild the Pisgah Covered Bridge, a historic structure demolished in August by floodwaters of the Little River. The bridge, which stood 10 miles southwest of Asheboro, was restored by the N.C. Zoological Society in 1999 as part of a project that included building a park and creating a nature walk. Built in 1911, it was one of two remaining covered bridges in the state—the other is in Claremont. Duck hunters may recall that the structure was featured on the 1999 state duck stamp, providing a background for a pair of mallards in flight.

Initially, Randolph County officials announced that it would be too expensive to rebuild the bridge. A large number of calls from bridge-lovers convinced the zoo to jump on board to rebuild the structure. In the days following the flash flood that wiped out the bridge, zoo employees salvaged remnants of the 51-foot structure from the river. Their goal is to rebuild the bridge with one that resembles the original, adding modern support systems that will prevent it from washing away again. The river banks and nearby trails will also be stabilized to guard against flood damage.

The restoration plan will be created with help from the N.C. Department of Transportation, which officially manages the structure. The zoo is an agency of the N.C. Department of Environment and Natural Resources. The N.C. Zoological Society is the zoo's nonprofit support organization.

Youth Wins Lifetime Fishing License

Kelsey McKinney loves to fish. Now, the Green Mountain angler will be able to indulge that passion for the rest of her life without ever having to pay for a fishing license. Kelsey, 11, the daughter of Tami and Robert McKinney, edged out an estimated 1,500 other young anglers to win a lifetime comprehensive fishing license, the grand prize offered in a statewide drawing for attendees at the 17 fish-for-fun clinics held by the N.C. Wildlife Resources Commission in June.

Commission Chairman John Pechmann presented Kelsey with her lifetime fishing license as well as a certificate of recognition. The license, valued at $250, gives Kelsey lifetime fishing privileges in all public waters, including designated Public Mountain Trout Waters, where her favorite fish are found.

"I started fishing when I was 4, and the very first fish I ever caught was a trout," Kelsey said. "They're my favorite fish because they taste good and they're easy to catch."

Easy to catch for a young angler who recently placed in her first fishing competition, taking second in the Biggest Fish Contest held during the Kids' Fishing Day event at South Toe Creek, Carolina Hemlocks in Yancey County. "I felt something jerk my line, and it just took off," Kelsey said of her 2-pound, 22-inch lunker rainbow. "I reeled and reeled until I finally got it in."

Kelsey attributes her keen angling skills to her dad, who taught her and her 9-year-old brother, Aaron, how to fish and who takes them fishing on a regular basis. "I like to eat the fish that I catch," Kelsey said. "I have fun getting outside, playing with my brother and spending time with my family."

JODY DUGGINS

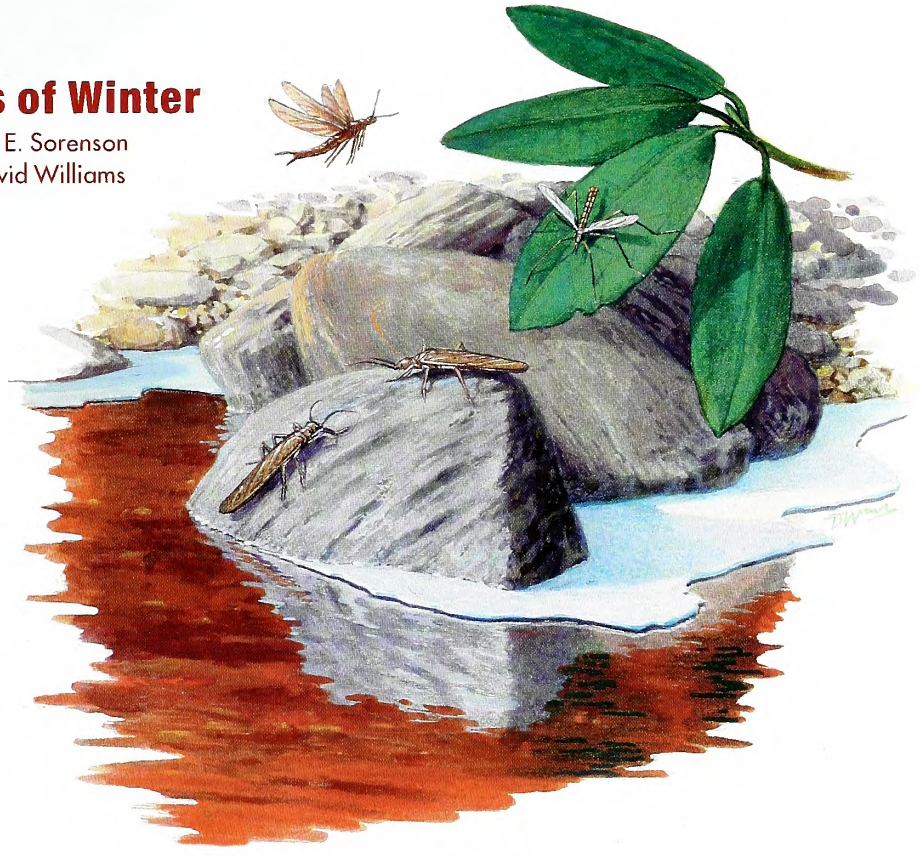
***Lifetime fishing license winner** Kelsey McKinney (center) with Wildlife Resources Commission Chairman John Pechmann and her mom, Tami McKinney.*

Kelsey is a sixth-grader at Cane River Middle School. Along with her, 99 other young anglers statewide netted prizes at the fishing clinics, held in celebration of National Fishing and Boating Week. For more information on lifetime fishing and hunting licenses, see page 41.

Nature's Ways

The Flies of Winter

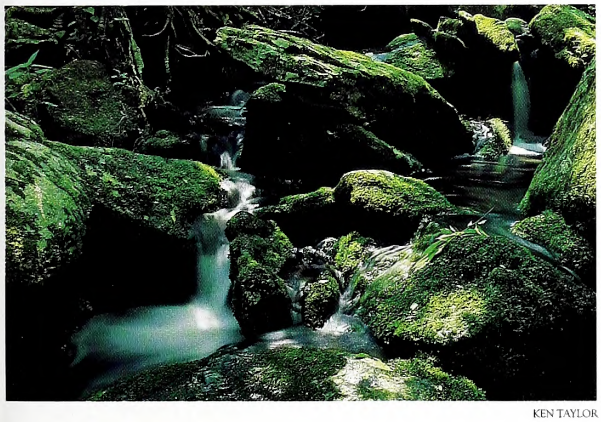
written by Clyde E. Sorenson
illustrated by David Williams



This time of year, many nature-watchers focus on winter birds visiting our feeders or maybe the waterfowl teeming in the eastern refuges. But even during winter, insects can be found. On mild days, mating winter crane flies swarm over marshes and lawns. On a cold day in a mountain trout stream, adult winter stoneflies engage in their courtship flights or congregate on sunny rocks.

The chief advantage active insects have in winter is the lack of predators. Virtually all the insects that might prey on them are dormant, and many of the birds that might eat them have migrated to warmer climes. Like other insects, winter flies are cold-blooded, but they have ways of coping with the weather. They may bask in the weak winter sun before flying, shiver their flight muscles to warm them or pick periods of calm, relatively mild air to become active. Some cold-weather insects even have a kind of antifreeze in their blood.

Nature Conservancy Protects Boone Fork Creek



KEN TAYLOR

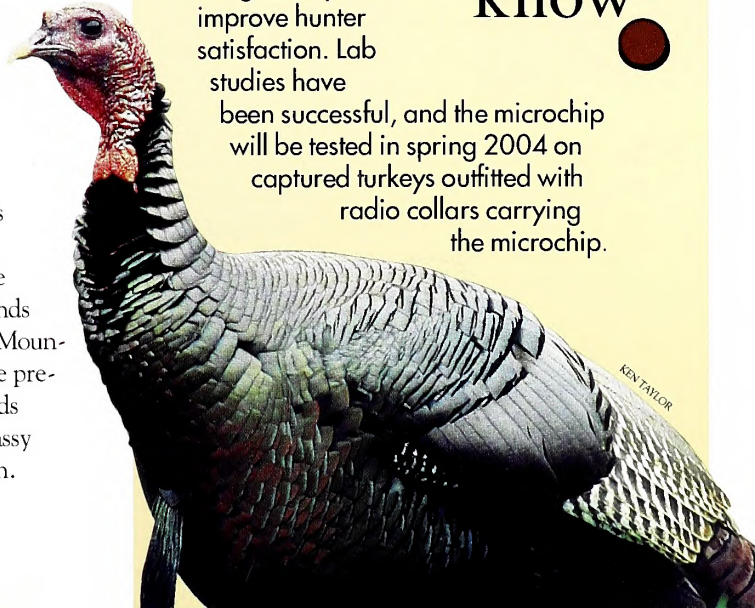
Grandfather Mountain, one of North Carolina's most renowned natural landmarks, received additional environmental protection recently when the North Carolina chapter of The Nature Conservancy purchased a conservation easement on Boone Fork Creek from Grandfather Mountain, Inc. The easement covers 925 acres and 12,408 linear feet of Boone Fork Creek from its headwaters to the Blue Ridge Parkway, protecting the creek's entire upper watershed. The purchase was made possible through a $3.3 million grant from North Carolina's Clean Water Management Trust Fund.

Fred Annand, associate director of The Nature Conservancy, said the group purchased the easement from Grandfather Mountain, Inc., owner Hugh Morton at a bargain price. Designated an International Biosphere Reserve, Grandfather Mountain is one of the most biologically significant sites in the southern Appalachians. Alan Weakley, curator of the N.C. Botanical Garden, describes it as the most important single site for rare plant species in eastern North America.

The Nature Conservancy has been working to protect Grandfather Mountain since 1991. The Boone Fork Creek Project expands the Conservancy's Grandfather Mountain Preserve to 3,590 acres. The preserve now protects the watersheds of Boone Fork Creek, Little Grassy Creek and Shanty Spring Branch.

did YOU know?

Biologists with the Virginia Department of Game and Inland Fisheries are testing a microchip that will record the date and time of a wild turkey's gobbles. Gobble data will be correlated with weather records to help determine when turkeys are most likely to gobble. Armed with that information, wildlife agencies should be able to fine-tune season dates to coincide with peak gobbling activity and improve hunter satisfaction. Lab studies have been successful, and the microchip will be tested in spring 2004 on captured turkeys outfitted with radio collars carrying the microchip.



KEN TAYLOR

Calendar of Events

Thursday–Saturday, Dec. 4–6

Have good cheer during Christmas With the Animals in Asheville. Contact Keith Mastin at (828) 298-5600, ext. 305, or kmastin@wildwnc.org, or visit www.wildwnc.org.

Thursday–Sunday, Dec. 4–7

Coastal traditions, crafts and activities take center stage at the Core Sound Waterfowl Weekend in Harkers Island. Call (252) 728-1500, e-mail museum@coresound.com or visit www.coresound.com.

Saturday–Sunday, Dec. 6–7

- Celebrate the return of thousands of tundra swans to Lake Mattamuskeet at the Swan Days Festival in Swan Quarter. Call 1-888-493-3826, visit www.hydecounty.org or e-mail hydecocc@direcway.com.
- Retriever demonstrations, an auction and the traditional loon-calling contest highlight the Core Sound Decoy Festival in Harkers Island. Call Raymond Earp at (252) 728-3070 or visit www.decoyguild.com.

CHIMNEY ROCK PARK

Saturday, Dec. 6 & 13

Watch Santa prepare for his big night by rappelling down the chimney at Chimney Rock State Park. Visit www.chimneyrockpark.com or call 1-800-277-9611, ext. 10.

Friday–Wednesday, Dec. 12–17

Enjoy the First Flight Centennial Celebration, a festival celebrating the 100th anniversary of the Wright Brothers' historic flight. For information, contact the Outer Banks Visitors' Bureau at (252) 441-7430 or visit www.firstflightcentennial.org. For tickets, call 1-800-973-7327.

Readers should check with the contact listed before traveling to an event. Items for listing should be conservation-oriented and should be submitted at least four months in advance to greg.jenkins@ncwildlife.org, or call (919) 733-7123, Ext. 264.

How to Purchase Your Own Hunting Land

For deer hunters who have wondered how they can buy their own hunting property, there is strength in numbers. An innovative way to beat the high costs of land purchase, maintenance and taxes is to form a corporation and sell shares. The process is not easy, but this guide gives an idea of what is involved.

KEN TAYLOR

Form a pool of potential investors. Having a property already in mind will help, but is not critical at this stage. Invite people you like and those with similar management goals.

Inform investors when money is needed. Since large sums often are required for down payments, improvements and equipment, investors have to be ready to write the check. When it is time to close the deal, you will see who is truly committed.

Establish a set payment schedule. You can pay monthly if you like, but payments every six months allow shareholders time to save.

Locate a property. Once the property size and purchase price have been established, determine the cost per acre, and try to get it owner-financed. The interest rate and down payment are often lower with owner financing.

Have someone run a title search. You must contact the Secretary of State's office to check if your corporation's name has been reserved previously. Unless someone in your group has accounting experience, you will have to hire a CPA to handle your tax papers and corporation establishment requirements.

Hold a corporate meeting. Elect officers, establish bylaws and open a checking account. It is important to have well-documented procedures for making decisions related to the property. This will clearly define the voting rules and how many votes it takes to pass or defeat any proposed action.

Once you own the property, you can make it into anything you (and a majority of shareholders) desire. You can plant beneficial trees or cut trees to clear areas for food plots. Projects you can do on your own land are limited only by resources and imagination.

This article was reprinted with permission from the Quality Deer Management Association, a nonprofit conservation organization. The association promotes proper herd and habitat management techniques. For more information on the group, call 1-800-209-DEER or visit www.qdmo.com.

On Patrol

ILLUSTRATION BY JACKIE PITTMAN

While seeking a night deer-hunting setup, Sgt. Timothy Sasser and Master Officer Michael Owens saw a man riding down the road on a tractor. The officers thought it odd that the man was wearing hunting clothes and a blaze-orange hat. Suspecting that the man might use the bucket on the front of the tractor to retrieve a deer, the officers followed him down a path through the woods. Sasser discovered the man using the tractor to free a truck that was stuck in a field. In the back of the truck was a nice 10-point buck. Sasser inspected the man's hunting license and found he had not validated his report card. Owens inspected the license further and found it was expired by two months.

Sills prevent beach erosion *and provide habitat for many different kinds of coastal creatures.*

N.C. COASTAL FEDERATION

Living Shorelines Law Enacted

In August, Gov. Mike Easley signed the Living Shorelines Law, creating a mandate for a new way of protecting the North Carolina coast and encouraging biological diversity. The law authorized the N.C. Coastal Resources Commission to manage for Living Shorelines projects, which consist of stone sills fronting marshes on the waterfront.

"Sills provide an environmentally friendly alternative to seawalls for people living by the water," said Jim Stephenson, spokesman for the N.C. Coastal Federation. "They prevent erosion of waterfront properties and create an ecologically rich habitat for fish and wildlife."

Sills are structures created when stone is spread along the beach below the normal high-tide line. Just beyond the sills on the inland side, beneficial coastal marsh grasses are planted to help preserve or restore habitat for swamp-dependent species. Because they are partially or fully covered by tides each day, the sills become valuable habitat for fish and shellfish such as oysters and crabs. They also provide hiding, resting and feeding spots for shorebirds, mammals and other estuarine animals. The nooks and crannies of a stone sill become home to sea urchins, sea squirts, anemones, hydroids and numerous fish that hide and feed among the rocks and marsh grasses.

The new law strengthens existing rules by prohibiting hardened structures in ocean and inlet hazard areas. Seawalls cause the beach to scour and disappear in front of the wall. Seawalls also increase erosion on adjacent properties, and jetties and groins starve nearby beaches by halting the flow of sand.

The N.C. Coastal Federation has designed more than a dozen Living Shorelines projects along the coast, including projects at Duke Marine Lab, the N.C. Maritime Museum, the N.C. Aquarium at Pine Knoll Shores, Hammocks Beach State Park and Festival Park in Manteo. The federation can provide technical assistance to contractors and information to homeowners interested in learning more about sills. Contact the N.C. Coastal Federation at 1-800-232-6210.

American ginseng

MELISSA McGAW

Letters to the Editor

To the editor:

When I moved to Louisville, Ky., in 1985, I made sure that my *Wildlife In North Carolina* followed me. I look forward to flipping through your magazine to see what part of my childhood in eastern North Carolina you will take me to this month.

In September it was the article on Indiantown Creek ("Blackwater Paddling Adventures"). When I was a teenager, my father and I looked forward to spending the week of the Fourth of July in the area. We would fish Indiantown Creek on Saturday and Hall's Creek on Sunday.

The article on johnboat fishing ("Small Craft Advisory," July 2003) reminded me of the many afternoons we slid our boat in at Wards Bridge on Tranter's Creek. Even when I was a little tyke, he would take me there. The article on striped bass on Roanoke River in Weldon ("The Shocking Truth," February 2002) reminded me of our annual family Easter trip. In those days, you loaded your boat on a cable car and they lowered you and your boat into the swift water.

Until I reach retirement age and can move back, I just hope you continue to write articles that take me back home—if only for a few hours.

—H. Ray Franks, Catlettsburg, Ky.

To the editor:

The article "On the Trail of Plant Poachers" in the September issue raised a red flag to this reader. First, one wonders why it should be illegal to harvest plants such as ginseng from the federally controlled parks. It seems a lot of the restrictions placed on the public in using our parkland are the results of lobbying by some environmental group that usually has a political reason disguised as an environmental concern.

Banning the harvesting of plants entirely restricts the responsible members of the public from harvesting a small amount of the plant for personal use. A permit program with a limit on harvested amounts would at least distinguish the law abider from the poacher.

One wonders why our tax dollars are being spent on committing manpower using the latest high-tech methods and equipment on something that can be and should be open to the public to participate in with reasonable common sense control. Returning excavated roots back to their place of origin probably costs the taxpayer a lot more than $600 a pound.

—John Teare, Beaufort

Going Bald?

You know that spot in your yard that just won't grow grass no matter how hard you try? You can seed, water, fertilize and aerate it; the patch of ground still looks like a candidate for Rogaine.

Chances are good that your receding grass line is located near a group of trees that are blocking light and sucking up all available nutrients and moisture in the ground.

This year, instead of fighting that losing battle to grow grass, why not try a comb-over of sorts? Rake fallen leaves onto your bald patch, spreading them thickly and evenly around the trees and surrounding bare ground. Once a landscaped area is established, it would be good to follow up with a healthy load of mulch.

But wait, it's not finished. No natural landscaping would be complete without decorative features to attract wildlife. These can include bird baths, feeders and houses as well as butterfly bushes, azaleas and anything else you desire.

With just a little effort, your bald patch can be covered with a toupee guaranteed to please all sorts of critters—or your money back.

—*Chris Powell*

Catch Us at these *Numbers*

1-800-662-7137 ta repart vialotions of hunting ond fishing lows

1-800-628-3773 (NC VESSEL) for boat registrotian ond titling

1-800-675-0263 for hunting dotes and shooting hours for migratory gome birds

1-888-248-6834 (2HUNTFISH) to purchose most licenses with VISA or MosterCord using o touch-tane telephone

1-800-446-8663 (I GOT ONE) to report big game horvests

Connect to the Commission's online Web site ot **www.ncwildlife.org**

Calls are answered in order, but some numbers may require a wait during busy seasons.

Report Big-Game Harvests Online

Big-game hunters have a new option for reporting their harvests this year—online reporting through the N.C. Wildlife Resources Commission's Web site. As always, hunters are required to report harvests of deer, bears, turkeys and wild boars to the commission. There are now four ways you can report your kill:

1. Call toll free at 1-800-I-GOT-ONE (1-800-446-8663).
2. Visit your local wildlife cooperator agent.
3. Stop by a commission check station. Check the *2003–2004 North Carolina Inland Fishing, Hunting and Trapping Regulations Digest* for dates and locations.
4. Register at www.ncwildlife.org by clicking the Online Services link.

BILL LEA

NOAA Creates Chart Update Web Site

Mariners have a new, easy way to access updated information for their nautical charts. The National Oceanic and Atmospheric Administration (NOAA) Ocean Service Office of Coast Survey has launched its new chart-update Web site at http://nauticalcharts.noaa.gov/mcd/updates/index.htm. The site provides access to information about regulatory changes, changes in aids to navigation and navigational hazards, bridge and cable clearances, water levels and harbor channel conditions.

Users have three options to access chart update data. The first option allows the user to enter the NOAA chart number and receive a list of updates from the most current to the oldest printing of the chart. The user can also enter a specific location such as a city, town or waterway or the name of a major United States port facility to receive a list of NOAA chart numbers pertaining to that area. The final option allows users to see all chart updates from previous chart editions.

CHART 11547

MOREHEAD CITY HARBOR CHANNEL DEPTHS

TABULATED FROM SURVEYS BY THE CORPS OF ENGINEERS - SURVEYS TO JUL 2003

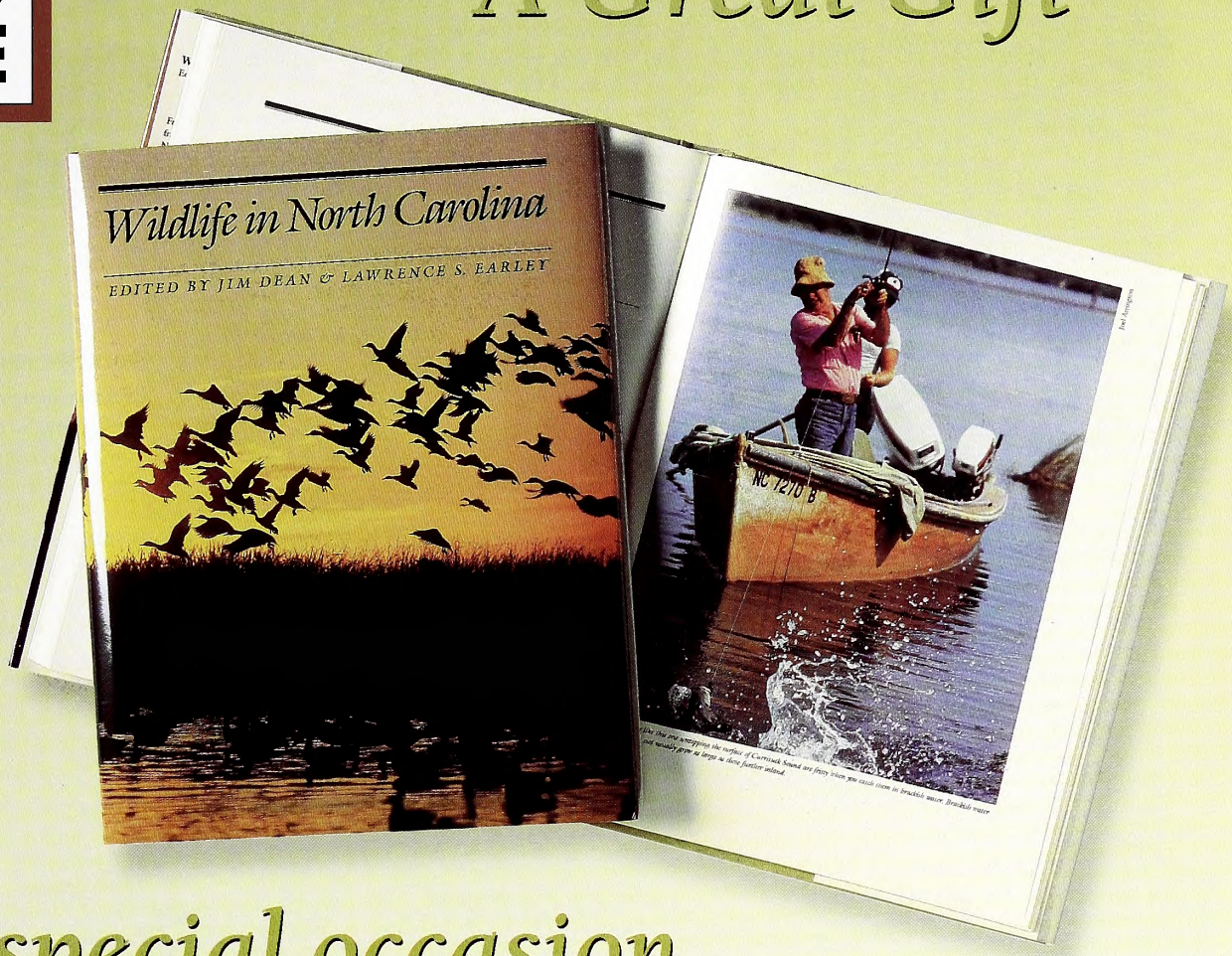
CONTROLLING DEPTHS FROM SEAWARD IN FEET AT MEAN LOWER LOW WATER (MLLW)						PROJECT DIMENSIONS		
NAME OF CHANNEL	LEFT OUTSIDE QUARTER	LEFT INSIDE QUARTER	RIGHT INSIDE QUARTER	RIGHT OUTSIDE QUARTER	DATE OF SURVEY	WIDTH (FEET)	LENGTH (NAUT. MILES)	DEPTH MLLW (FEET)
BEAUFORT INLET CHANNEL FROM								
2000 FT NORTH OF LTD. BUOY "8"	41.1	44.7	41.5	32.1	7-03	450-800	2.26	47
CUTOFF CHANNEL	48.9	49.2	47.2	38.5	7-03	600	0.38	42
MOREHEAD CITY CHANNEL	33.4	42.5	42.2	37.9	6-03	400	1.10	40
TURNING BASIN								
EAST LEG	43.4	42.4	43.4	40.5	6-03	400-870	0.78	40
WEST LEG	33.7	36.0	37.2	39.9	6-03	800-3000	0.59	35

NOTE - CONSULT THE CORPS OF ENGINEERS FOR CHANGES SUBSEQUENT TO THE ABOVE INFORMATION

Boaters may obtain *chart updates quickly through a new NOAA Web site.*

N.C. WILD STORE

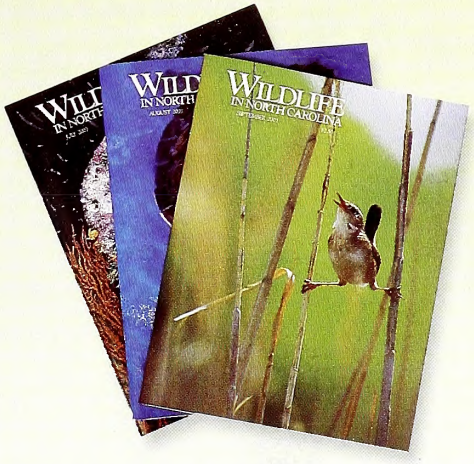
A Great Gift



For a special occasion . . .

Celebrate North Carolina's wildlife heritage with this commemorative book published on the golden anniversary of *Wildlife in North Carolina* magazine. It showcases the best articles from the magazine's first 50 years—from recollections of waterfowl hunting on the Currituck Sound to an unforgettable ramble through the Uwharrie Mountains. It's now out of print, but we have a limited supply that we are offering at a price that's much lower than the original $24.95. This 1987 hardbound edition makes a great gift for an outdoor enthusiast.

Hardbound $7.50
ITEM CODE M3



Combine it with a lifetime license or magazine subscription.

Order these items and all N.C. WILD Store products online at www.ncwildlife.org.

◀ Amphibians: Salamanders of North Carolina Poster Set

Become an expert on some of the state's most unique creatures. These three posters include a color illustration and life cycle notes for each of the 54 species that occur in North Carolina. Each poster is 24" x 36".

Set $15 ITEM CODE **P25**

Posters may be purchased separately.

Part 1. Thirteen species with lungs or gills.
$6 ITEM CODE **P19**

Part 2. Twenty lungless species: *Desmognathus* and *Eurycea*.
$6 ITEM CODE **P23**

Part 3. The remaining 21 lungless species.
$6 ITEM CODE **P24**

▲ Embroidered Caps

Exclusive designs and the *Wildlife in North Carolina* magazine logo are featured on four different cap styles.
$16.50 each

- Deer silhouette on 6-panel, solid-back cap. Advantage® Camouflage on cap and bill with plastic snap. ITEM CODE **A11**
- Brook trout on sage-colored, brushed cotton cap with an unstructured front, extended bill and nubuck suede closure. ITEM CODE **A3**
- Deer silhouette on blaze-orange cap with brown waxcloth bill. ITEM CODE **A7**
- Deer silhouette on Advantage® Camouflage cotton cap with tan suede bill. ITEM CODE **A6**

Amphibians: Frogs of North Carolina Poster Set ▶

These two posters showcase North Carolina's frogs and toads. Vibrant photos and informative text make them a stand-out in the home or classroom. Each poster is 22" x 34".

Set $10 ITEM CODE **P20**

Posters may be purchased separately.

The Hylid Frogs
$6 ITEM CODE **P11**

True Frogs & Toads
$6 ITEM CODE **P14**

Posters may be purchased separately.

Livebearers
$6 ITEM CODE **P5**

Egg-layers
$6 ITEM CODE **P8**

▼ Butterflies Poster Set

A brilliant selection of 17 rare and 19 common butterflies adorn these two posters. Range maps and informational text highlight the connections between the butterflies and their habitats. Each poster is 22" x 34".

Set $14 ITEM CODE **P17**

Free
Gardens for Butterflies guide with the purchase of a poster set.

Posters may be purchased separately.

Common Butterflies
$8 ITEM CODE **P15**

Rare Butterflies
$8 ITEM CODE **P16**

▲ Snakes of North Carolina Poster Set

Want to know more about the snakes of North Carolina and learn how to identify them? These colorful posters can help. Produced in cooperation with the N.C. Herpetological Society, these posters include indicators for snakes that are venomous, endangered or of special concern. Learn to appreciate the role snakes play in nature. Each poster is 24" x 36".

Set $10 ITEM CODE **P26**

T-shirts are limited editions. Adult sizes only.

Commemorating Our Sporting Heritage

left front design

▲ **Largemouth Bass.** This white, all-cotton tee features our sporting heritage logo on the front and a Duane Raver scene on the back—a largemouth at historic Atkinson's Mill.

$14.50 ITEM CODES:
A12MED (medium) **A12LRG** (large)
A12XXL (extra extra large)
Extra large size is no longer available.

left front design

▲ **Snow Geese.** Celebrate waterfowl conservation with this white, all-cotton tee. "Snows Over Hatteras" by Louis Frisino adorns the back, and our sporting heritage logo marks the front.

$14.50 ITEM CODES:
A14MED (medium) **A14XLG** (extra large)
A14LRG (large) **A14XXL** (extra extra large)

left front design

▲ **Wild Turkey.** A timeless spring scene makes this all-cotton tee a trophy. Wilhelm Goebel's rendition of a wild tom struts across the back, and the front displays our sporting heritage logo.

$14.50 ITEM CODES:
A13MED (medium) **A13LRG** (large)
A13XXL (extra extra large)
Extra large size is no longer available.

◀ **Sporting Dogs of North Carolina Poster Set**
These two posters present color portraits of 24 sporting breeds with descriptions of their habits and history. One poster depicts breeds that point or flush and retrieve birds. The second depicts those that trail and tree. Each poster is 22" x 34".

Set $16 ITEM CODE **P22**

Each poster may be purchased separately.

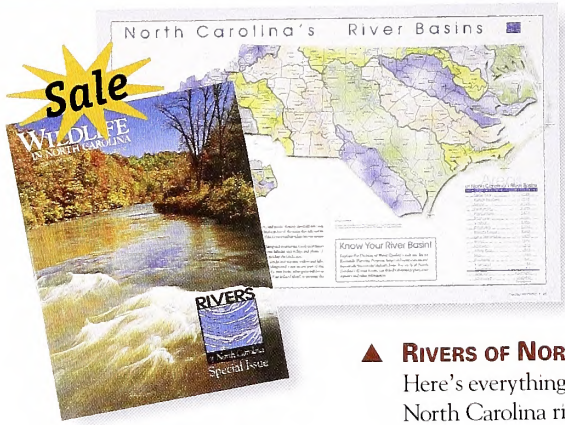
Pointing & Retrieving Breeds
$10 ITEM CODE **P18**

Trailing & Treeing Breeds
$10 ITEM CODE **P21**

Sporting Traditions Posters ▶
Each of these posters preserves a different sporting tradition. Enjoy color photographs of 19 classic decoys made during the heyday of waterfowl hunting or 16 treasured trout flies used in mountain streams. Each 22" x 34" poster is sold separately.

Waterfowl Decoys of North Carolina
$10 ITEM CODE **P12**

Traditional Trout Flies of the Southern Appalachians
$10 ITEM CODE **P13**



▲ Rivers of North Carolina

Here's everything you want to know about North Carolina rivers in a 128-page guide. This special issue of *Wildlife in North Carolina* (Nov. 1999) chronicles the natural history of 17 major river basins.

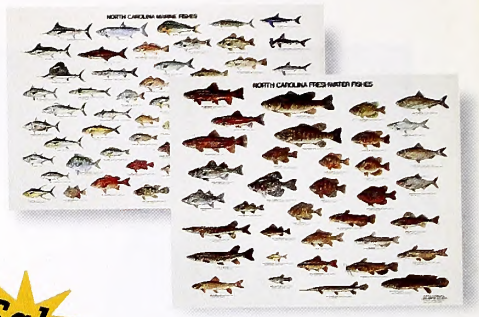
Half-price while supplies last.

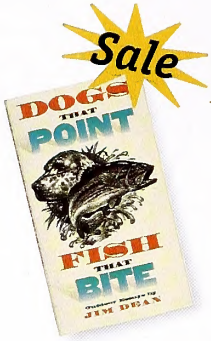
$5 ITEM CODE **M11**

Fishes of North Carolina ▶

Reel 'em in! This two-poster set depicts colorful paintings by Duane Raver of 36 freshwater species (28" x 22 1/2") and 60 marine species (35" x 22 1/2").

$10 ITEM CODE **P9**





◀ Dogs that Point, Fish that Bite

Sample 50 of Jim Dean's best essays for *Wildlife in North Carolina* magazine.

Hardbound ~~$19.95~~ $14.95

ITEM CODE **M8**

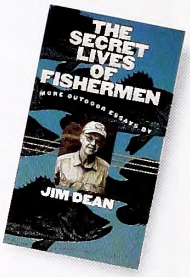
Paperback ~~$10.95~~ $8.00

ITEM CODE **M12**

Set of both volumes

Hardbound $30.00

ITEM CODE **M14**



The Secret Lives of Fishermen ▶

More of Jim Dean's well-honed observations on hunting, fishing and the country life.

Hardbound ~~$24.95~~ $18.50

ITEM CODE **M13**

2003 N.C. Migratory Waterfowl Print and Stamp ▶

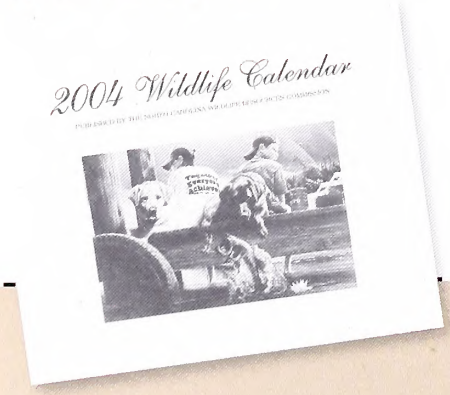
Buy North Carolina's 21st waterfowl print and stamp, and contribute to wetlands conservation. Wilhelm Goebel's "Traditions at Suggs Mill Pond" depicts the artist and his daughter hunting on a blackwater bay. Overall size: 12" x 14"; image size 6 1/2" x 9". Includes a free museum print of Ron Louque's "Canvasbacks at Whalehead."

No shipping-handling fee or discount applies.

Print and Stamp $145 ITEM CODE **DSP03**

Stamp Only $10 ITEM CODE **DSPS 03**

2004 North Carolina Wildlife Calendar ▼



2003–2004 Federal Duck ▶ Print and Stamp

Greater snow geese take wing over the Chincoteague National Wildlife Refuge on the 70th edition of the federal duck stamp. Artist Ron Louque is making signed prints of the stamp available, and we have a limited number. Overall print size: 12" x 14"; image size: 6 1/2" x 9". Includes a free museum print of the artist's "Canvasbacks at Whalehead."

A $9.50 shipping and handling fee applies.

This item not subject to 15% discount.

Print $189 ITEM CODE **FDSP03**

Stamp $16 ITEM CODE **FDSS03**

A Great Gift!

Place your order now. Complete and mail to CALENDAR, N.C. Wildlife Resources Commission, 1710 Mail Service Center, Raleigh, NC 27699-1710. To order by phone, call (919) 662-4377. Order online after September 1 at www.ncwildlife.org, or visit the sales office at 322 Chapanoke Road in Raleigh. (Allow 3 weeks for delivery.)

Complete the form below.

Name _____

Address _____

City/State/Zip _____

Calendar Costs:

1 to 9	$6 each
10 to 25	$5.50 each
26 to 199	$5 each

Please send _____ N.C. Wildlife Calendars at $_____ each. $_____

N.C. residents add 7% sales tax. $_____

(Wholesale orders are exempt from sales tax with a completed Certificate of Resale.)

Total $_____

ALL ORDERS MUST BE PREPAID BY CHECK, MONEY ORDER OR CREDIT CARD.

☐ Check or money order enclosed made payable to **NCWRC**. ($20 charge on returned checks—N.C.G.S. 25-3-512.)

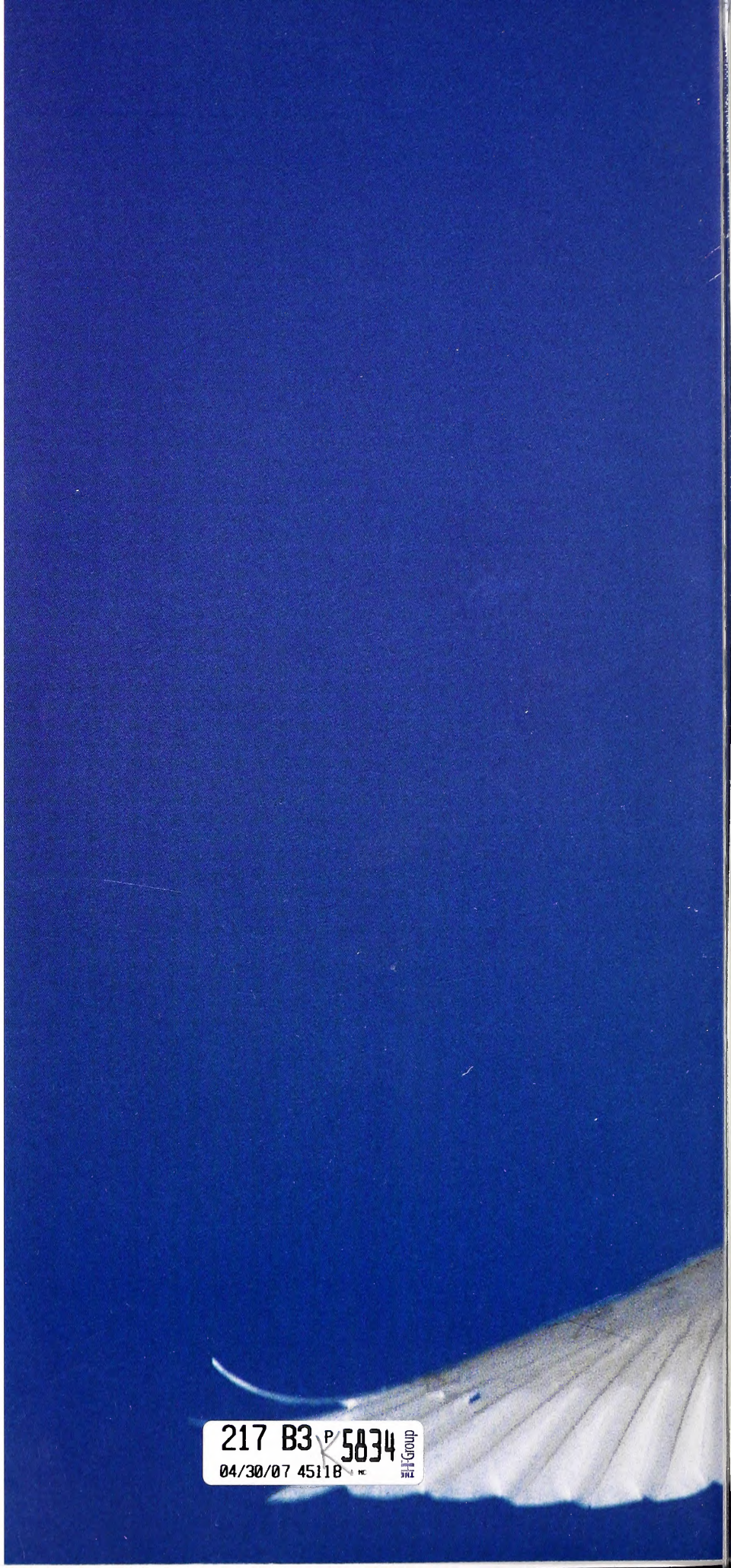
☐ VISA MasterCard # _____ Exp. ____/____

Signature _____ Phone ( ) _____

Your gift of a lifetime fishing, hunting or sportsman license helps ensure the future of fish and wildlife.

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION
www.ncwildlife.org

To purchase a license, see form on preceding page.



Winter Visitor

Tundra swans fill winter skies above North Carolina's eastern waterways. Read about the state's waterfowl populations, page 2, and a Navy project near Pocosin Lakes National Wildlife Refuge, page 14.

LITHOGRAPHY BY PBM GRAPHICS INC.,
RESEARCH TRIANGLE PARK, NORTH CAROLINA

recycled,
30% post-consumer content

217 B3 P 5834
04/30/07 45118 NC
IHGroup

STATE LIBRARY OF NORTH CAROLINA
3 3091 00733 1630